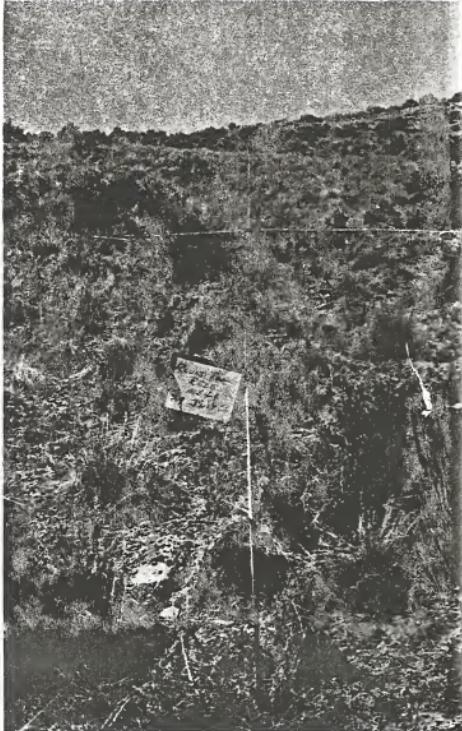




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1966 RESULTS

ARID LAND ECOLOGY RESEARCH

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ARID LAND ECOLOGY RESEARCH

by

Fisser, H. G., G. L. Noller, R. E. Steger<sup>1</sup>

Table of Contents

- Section I - 14 pages  
Soil moisture and temperature study - Smilo, Granite Mountain,  
and Cumberland exclosures.
- Section II - 30 pages  
Microclimate studies in desert shrub communities.
- Section III - 4 pages  
Precipitation pattern study.
- Section IV - 89 pages  
Exclosure studies (production, cover, and precipitation phase).

Frontispiece

Range ecology and condition class studies are dependent upon comparison to relic areas; those which have not been disturbed or have been subjected to little or no use in the recent past. The lower picture portrays the sparse sagebrush and dense grass cover on the North Butte-Thermopolis semi relic, formerly a part of the Hot Springs State Park which was grazed by elk until approximately 1950. Similar vegetation is present on Round Top Mountain, shown in the background of the lower picture. Round Top Mountain is a true relic since the precipitous rock slopes discourage access to large animals. A closeup of the vegetation, shown in the upper photo, reveals again a sparse sagebrush stand and good grass understory typical of the arid land climatic potential for the region.

Published with approval of the Director, Wyoming Agricultural Experiment Station, as Scientific Report No. 41.

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## S E C T I O N   I

### SOIL MOISTURE AND TEMPERATURE STUDIES 1966

#### Introduction

Studies to evaluate soil moisture and temperature characteristics as influenced by sagebrush control and livestock grazing were initiated in 1963. Soil moisture was determined by use of a neutron scattering meter. Permanent metal access tubes, 2" in diameter, were set into the ground to a depth of 5'. The neutron probe measures the amount of water in the soil through an area of about 4' in diameter. Soil temperatures were measured with thermister probes placed at 8, 15, and 22" below the surface. Lead cables from the buried sensitive elements were connected to a meter for an instantaneous reading of temperature. Surface temperatures were read with a portable probe. At the Smilo and Granite Mountain Exclosures two access tubes were located in each of the following treatments at each study site: Inside Sagebrush Sprayed, Inside Sagebrush Non-Sprayed, Outside Sagebrush Sprayed and Outside Sagebrush Non-Sprayed. At the Cumberland #1 and Cumberland #4 Exclosures three access tubes were placed in each of the two treatments inside the exclosures: Sagebrush Sprayed and Sagebrush Non-Sprayed.

#### 1966 Results

Soil moisture and temperature data were collected on 8 dates in the Cumberland #1 and Cumberland #4 Exclosures. These data are presented in Tables 1 and 2. At the Smilo and Granite Mountain Exclosures, soil moisture and temperature data were collected on 12 dates during 1966. Analysis of data was conducted with the aid of the University's electronic computer.

A paper was prepared for presentation at the Range Management Society Meeting in Seattle, Washington, on February 14, 1967. The title of the paper is "Soil Moisture and Temperature Characteristics as Related to Grass Production Following Shrub Control Under Grazed and Non-Grazed Conditions." This paper, which entailed an analysis of the soil moisture, soil temperature, precipitation, and forage production characteristics at the Smilo and Granite Mountain Exclosures, included all of the data collected at those sites from June, 1963 through December, 1966. The data are therefore presented in a summarized form as presented in the paper. Exerpts from this paper are presented below:

#### Descriptions of Study Areas

The Granite Mountain Exclosure in the mesic uplands of the Wind River Basin of central Wyoming was situated at an elevation of 7000'. Average annual precipitation is approximately 12", with much occurring as snow. Summer showers are common on these uplands east of the Wind River Mountain range. The 8.9" average annual precipitation quoted for the five years of

Table 1. Cumberland #1 Exclosure. Soil moisture readings (inches of moisture per 12 inches of soil) as affected by sagebrush control - 1966 (Each figure is an average of readings in three access tubes).

Inside Spray	Apr. 16	June 11	June 27	Aug. 14	Aug. 31	Oct. 20	Dec. 19	Mean
6"	3.24	1.78	1.48	1.50	1.41	2.26	2.51	2.025
12"	2.74	1.82	1.61	1.55	1.54	1.54	1.61	1.772
18"	2.35	1.95	1.73	1.65	1.64	1.59	1.57	1.782
24"	1.75	1.76	1.75	1.65	1.65	1.62	1.65	1.690
36"	1.79	1.87	1.85	1.88	1.88	1.81	1.87	1.850
48"	1.99	2.04	2.05	2.05	2.05	2.02	1.98	2.025
60"	2.00	2.10	1.97	2.02	2.02	1.94	1.99	2.005
Mean	2.26	1.90	1.78	1.76	1.74	1.82	1.88	1.877

Inside Non Spray	Apr. 16	June 11	June 27	Aug. 14	Aug. 31	Oct. 20	Dec. 19	Mean
6"	3.22	1.86	1.49	1.54	1.46	2.38	2.49	2.062
12"	2.86	1.68	1.57	1.52	1.49	1.51	1.64	1.752
18"	2.26	1.96	1.81	1.71	1.70	1.73	1.74	1.844
24"	1.78	1.82	1.77	1.71	1.74	1.70	1.77	1.755
36"	1.80	1.84	1.80	1.86	1.83	1.84	1.81	1.825
48"	1.98	2.02	2.01	2.05	2.05	2.01	2.04	2.022
60"	2.02	2.08	1.99	2.07	2.03	2.07	2.04	2.042
Mean	2.28	1.90	1.78	1.78	1.76	1.89	1.93	1.902

Table 2. Cumberland #3 Exclosure. Soil moisture readings (inches of moisture per 12 inches of soil) as affected by sagebrush control - 1966 (Each figure is an average of readings in three access tubes).

Inside Spray	Apr. 15	June 11	June 28	Aug. 14	Aug. 31	Oct. 20	Dec. 19	Mean
6"	3.51	1.78	1.93	1.64	1.65	2.36	3.08	2.278
12"	3.72	2.38	2.19	1.80	1.78	1.83	2.04	2.248
18"	3.60	2.87	2.49	1.96	1.90	1.93	1.95	2.385
24"	2.95	2.80	2.46	1.98	1.96	1.93	1.91	2.284
36"	2.03	2.45	2.31	2.07	2.01	2.02	1.97	2.122
48"	1.92	2.15	2.08	2.02	2.02	2.01	1.99	2.027
60"	1.94	2.07	2.04	2.04	2.07	2.04	1.96	2.022
Mean	2.81	2.36	2.22	1.93	1.91	2.02	2.13	2.197

Inside Non Spray	Apr. 15	June 11	June 28	Aug. 14	Aug. 31	Oct. 20	Dec. 19	Mean
6"	3.54	1.75	1.74	1.51	1.52	2.29	2.65	2.142
12"	3.54	2.04	1.92	1.63	1.62	1.70	1.82	2.038
18"	3.47	2.39	2.13	1.76	1.71	1.80	1.78	2.148
24"	2.87	2.29	2.10	1.69	1.64	1.72	1.85	2.022
36"	1.82	2.05	1.89	1.54	1.64	1.67	1.60	1.744
48"	1.67	1.84	1.83	1.72	1.71	1.71	1.67	1.735
60"	1.57	1.63	1.64	1.61	1.57	1.55	1.60	1.595
Mean	2.64	2.00	1.89	1.64	1.63	1.78	1.85	1.918

study is much below the long term average and probably reflects to some extent also the fact that snowfall is not accurately measured in the type of precipitation gauge used.

The Smilo Exclosure was located in the Big Horn Basin of north central Wyoming, a northern cold desert shrub area, at an elevation of 4500', some 2500' lower in elevation than the Granite Mountain Exclosure. This area receives only about 7.5" of precipitation annually. Little snow occurs and summer rains are infrequent, but usually of high intensity. Almost 50% of annual precipitation occurs as rain during the spring period from April 15 to June 30. Summer temperatures are much higher at the arid Smilo Exclosure than at the Granite Mountain. The effective growing season is severely limited by temperature and aridity at the former.

Soils at the mesic Granite Mountain site are classified as Encampment Loam, a deep, strongly developed soil with good drainage which is usually found on old terraces and fans. The arid site is characterized by the Dry Creek Fine Sandy Loam soil. This is a deep soil also, but is poorly developed, and has low permeability, reflecting the arid climate of the Big Horn Basin.

### Results

Herbage production response was phenomenal during the 5 years from 1962, when the shrub control and grazing treatments were initiated, through 1966 (Figure 1). On the Granite Mountain Exclosure *Agropyron smithii*, *Poa fendleriana*, and *P. secunda* were the dominant understory species. *A. smithii* exhibited a great increase in production under sagebrush control. A minor increase was associated with cessation of grazing and no shrub control. Production in the grazed-native sites tended to decrease.

The major grasses on the Smilo Exclosure were *A. smithii* and *P. secunda*. Response of *A. smithii* to treatments was proportionally similar at both locations, but was much less spectacular under the arid conditions present at the Smilo site. The extremely arid 1966 moisture conditions there, are reflected by a sharp production decrease. Greatest production occurred under the shrub control and non-use treatments.

Soil temperature data, in Figure 2, averaged over all depths, and seasons of measurement, show a distinct difference due to location, with an annual average temperature of approximately 11° C at the mesic Granite Mountain site and 15° C at the arid Smilo site. Soil temperatures during the spring period increased most rapidly at Smilo, and remained high during the summer, whereas a more rapid decrease was noted during the summer and fall periods at Granite Mountain. Mid-dates of each of the 5 seasons are given in the Figure.

Soil temperature differences due to sagebrush control appear insignificant but have followed a consistent trend at the two study sites during the past 5 years. Under sagebrush, temperatures were almost 1° C warmer than in the shrub control areas. This pattern was reversed at the Granite

Mountain site during the winter and summer periods, but at the Smilo site, the only apparent reversal occurred during the early summer period.

A greater variation between surface temperatures and subsoil temperatures was exhibited at Granite Mountain than at Smilo (Figure 3). In relation to warming in the spring subsurface temperatures at Smilo rose more rapidly than at Granite Mountain. During fall and winter, subsurface temperatures at Smilo fell slower and did not become as cold as those at Granite Mountain.

Greatest differences in subsurface temperatures resulting from sagebrush control were noted at the 15" depth, where soils at both sites tended to be much warmer in the native areas than in those subjected to sagebrush control.

At the 8" depth, temperatures were greater under the shrub control treatment at Granite Mountain but almost equal at Smilo. These variations from the normal pattern of higher temperatures under sagebrush must necessarily be associated with grassland moisture utilization capabilities, associated with changes in soil moisture as influenced by site peculiarities.

The influence of grazing and shrub control treatments upon soil moisture levels, presents important variations at the two study sites (Figure 4). The recharge data are based on amounts of water in the soil and as such, reflect amount of water penetration during the spring recharge period, and also the water lost from the soil by evapo-transpiration. At Granite Mountain, recharge under non-grazing was much less than in the grazed area. At Smilo a very insignificant variation occurred.

Under the shrub control treatment at Smilo, much less moisture was stored in the soil than in the non-sprayed sagebrush area. A similar pattern occurred at Granite Mountain, but the variation was minor. These soil moisture recharge data certainly show the varying influence of differences in soil permeability and moisture loss due to plant use under the two study treatments.

Withdrawal of soil moisture was similar at the two study sites. Less moisture was taken from the soil under the grazed and non-sprayed treatments than in the areas which were non-grazed and shrub controlled.

Seasonal moisture levels, averaged over all depths and years, portray greater rates and amounts of soil moisture withdrawal and recharge variation, at the mesic Granite Mountain site as compared to the arid Smilo site (Figure 5). Differences between treatments again appear insignificant.

During the spring period from mid-March to mid-June, soil moisture levels by depth, which are given in inches in depth below the soil surface, show the influence of high soil permeability at Granite Mountain (Figure 6). Under shrub control high moisture content occurred below 24" in the zone from which sagebrush normally utilizes great amounts of water. Low moisture levels occurred above 24" in the grass root zone. At Smilo, the very low moisture under shrub control apparently resulted from utilization of most of the available moisture at the upper level by grasses. The very high

moisture content of the surface to 6" depth reflects the relative impermeability of soils at this site.

By early summer the pattern of soil moisture (Figure 7) changes to a configuration which is similar through the summer, fall and winter seasons (Figures 8, 9, 10). These data exemplify the influence of differing climates and soils on moisture relationships and the strong interaction at both locations, with time and treatments.

At Granite Mountain grasses utilize almost all available moisture in the upper 2' of soil, but that which is not utilized, moves downward to accumulate in the 36" to 60" zone from which sagebrush depends for its major water supply.

At Smilo, water loss due to runoff, even on level areas, combines with low infiltration to explain some of the contradictory findings of other workers. At the 6" level under shrub control we see the same pattern as that exhibited through the 24" depth at Granite Mountain, and a similar pattern from 12" through 36" at Smilo, as compared to the 24" through 60" depth at Granite Mountain.

#### Discussion

Non-grazing and sagebrush control treatments result in similar vegetative responses. Greatest response to cessation of livestock utilization occurs on rangeland in poor condition relative to climax composition. Response to sagebrush control is analogous, except on sites where condition has deteriorated to such an extent that insufficient native vegetation remains for re-establishment of formerly abundant species. In actuality, this condition may occur as well in situations of continued intensive grazing pressure.

Basal area of understory species increased more than two-fold during the 5 years of study. During the first 2 years greatest increase was exhibited by *Poa secunda*, a short-leaved, early-maturing species. Basal area of *Agropyron smithii* increased more slowly as did other decreaser species, which provide much more ground cover and production per unit of basal area than *P. secunda*. Thus, the decreased soil temperature associated with sagebrush control must be related to light and heat interception by herbaceous vegetation. This concept has been examined by Geiger (1957) but few would extrapolate his work to the rather sparse and diminutive vegetation of the northern cold deserts.

Robertson's 1947 work in Nevada indicated that soil moisture increased under sagebrush control, but Hutchison (1956) found the opposite. Both men were probably correct in conceptual application to the sites on which their work was conducted. The present study shows two kinds of conditions. On the mesic study site at the Granite Mountain Exclosure, soil moisture levels were much lower, under sagebrush control and non-use, than in the sagebrush and grazed areas, but little variation was noted on the arid study site at the Smilo Exclosure.

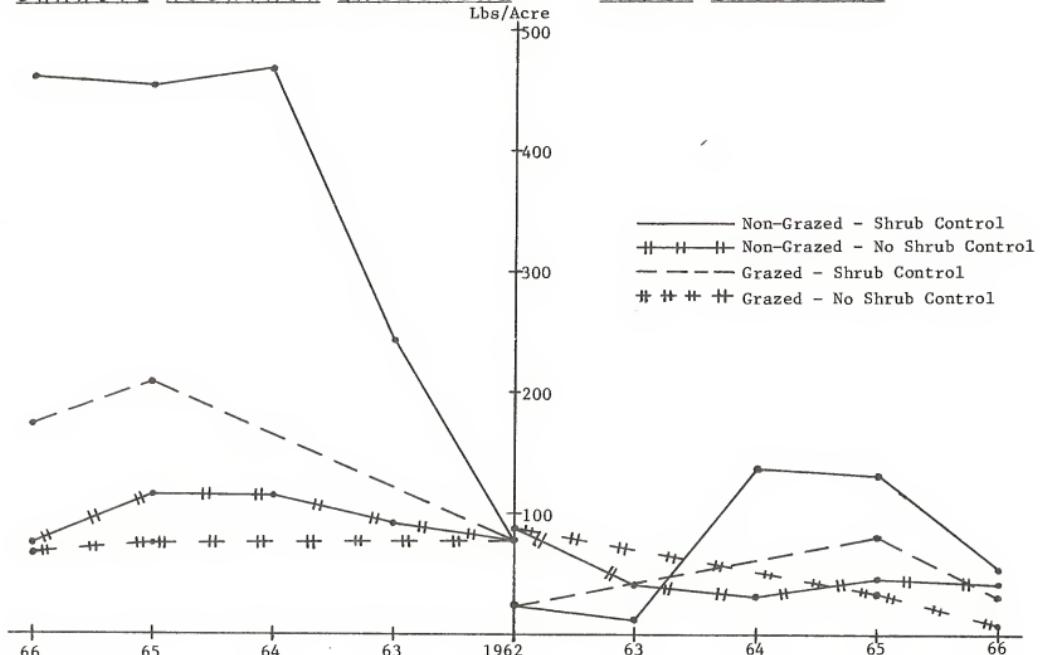
At the Smilo Exclosure, the more arid climate, associated with impermeable soils, resulted in greater restriction to vegetative potential, although species composition was similar to that at Granite Mountain. Increased herbage production and basal area, innately require greater amounts of water, and sagebrush removal liberates soil moisture; but the key to the problem can be found in the Oklahoma work of Prill (1965) in which he found grasses able to utilize more of the soil moisture than sagebrush. It is generally recognized that sagebrush is a wasteful and rapid user of available moisture, but grasses are apparently able to withdraw more from the soil, over a longer period of time, than the shrubs.

Soil moisture differences between the two study areas are thus a result of climatic variation, soil differences, and variation in rate of vegetative rehabilitation. At the mesic grassland site, understory vegetation was able to increase sufficiently following sagebrush removal, to utilize more of the soil moisture than pre-existing vegetation. At the arid cold desert shrub site, rigid climatic characteristics did not allow sufficient revegetation for effective utilization of the released soil moisture following sagebrush control.

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4. Robertson, J. H. 1947. Ecol. 38:1-16.

### GRANITE MOUNTAIN EXPOSURE

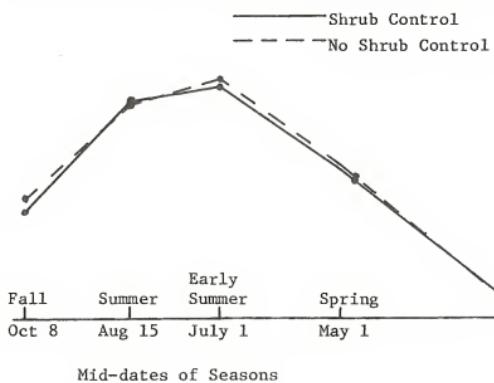


### SMILO EXPOSURE

Figure 1.

Herbage production of *Agropyron smithii* as influenced by the sagebrush and grazing control treatments.

### GRANITE MOUNTAIN EXCLOSURE



### SMILO EXCLOSURE

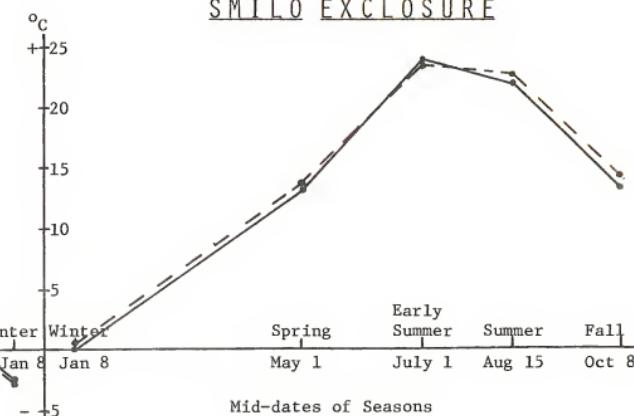


Figure 2.

Soil temperature changes averaged over all depths, by season and treatment from initial data (July 24, 1963) through December, 1966.

GRANITE MOUNTAIN EXCLOSURE

— Shrub Control  
- - - No Shrub Control

SMILO EXCLOSURE

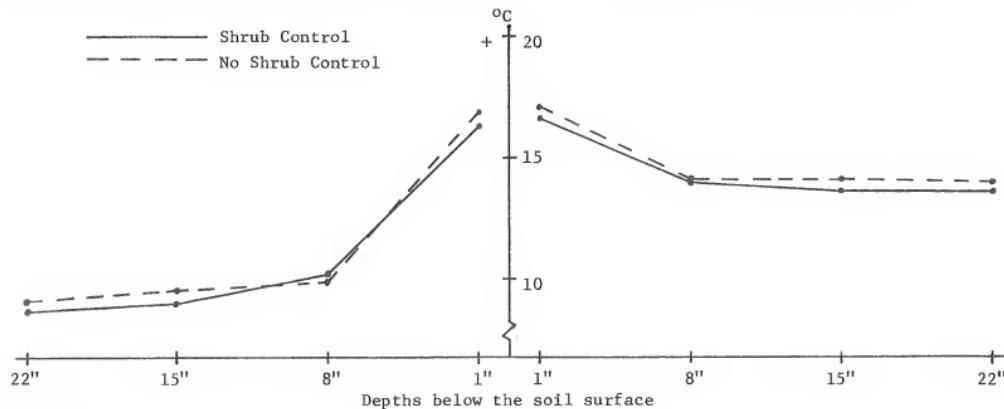


Figure 3.

Soil temperature by depths and treatment from initial data (July 23, 1963) through December, 1966.

GRANITE MOUNTAIN EXCLOSURE      SMILO EXCLOSURE

INCHES  $H_2O$   
PER 12" SOIL

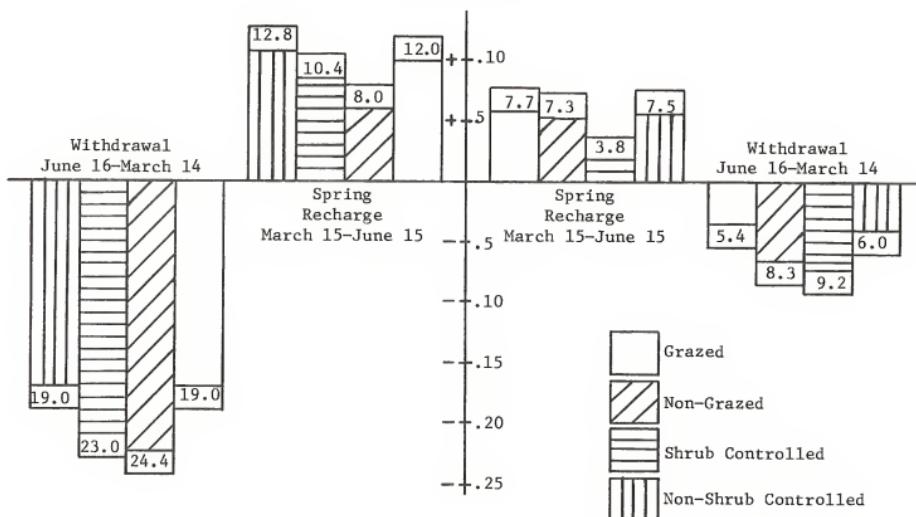
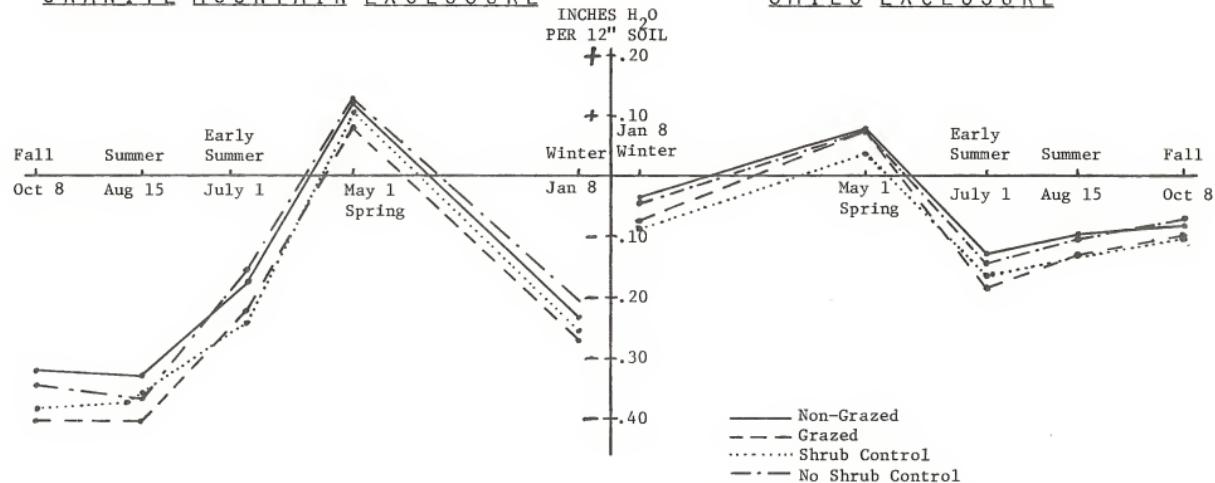


Figure 4. Soil moisture change over all depths by treatment, from initial data (July 24, 1963) through December, 1966.

### GRANITE MOUNTAIN EXCLOSURE



### SMILO EXCLOSURE

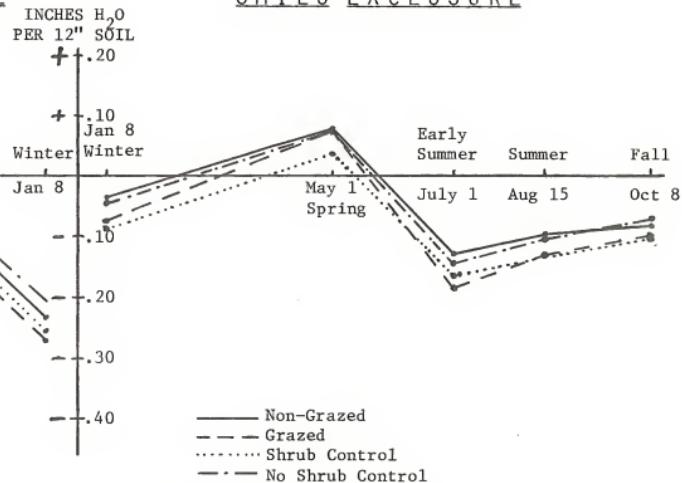


Figure 5. Soil moisture change averaged over all depths by seasons and treatments from initial data (July 24, 1963) through December, 1966.

### GRANITE MOUNTAIN EXCLUSION

### SMILO EXCLUSION

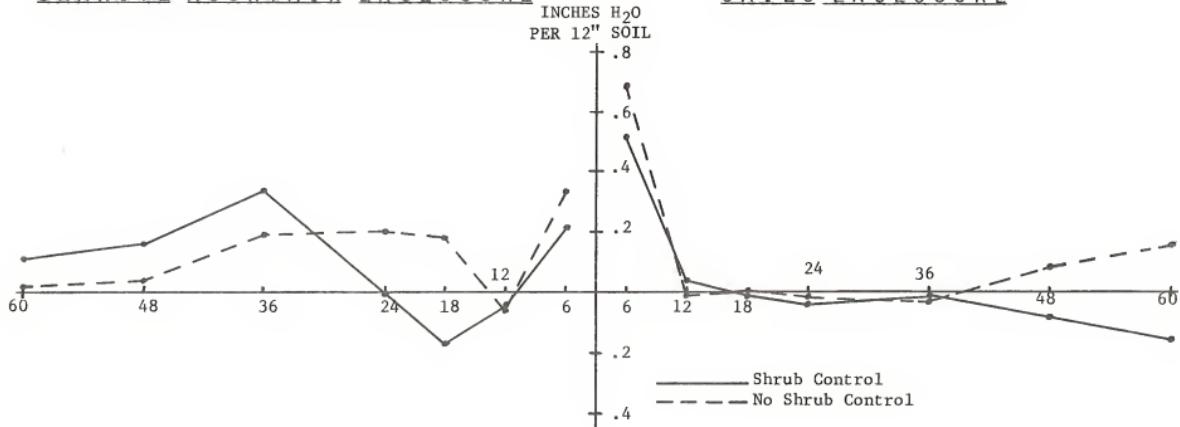


Figure 6. Spring moisture change by depths from initial data (July 24, 1963) through December, 1966.

GRANITE MOUNTAIN EXCLOSURE

SMILO EXCLOSURE

INCHES H<sub>2</sub>O  
PER 12" SOIL

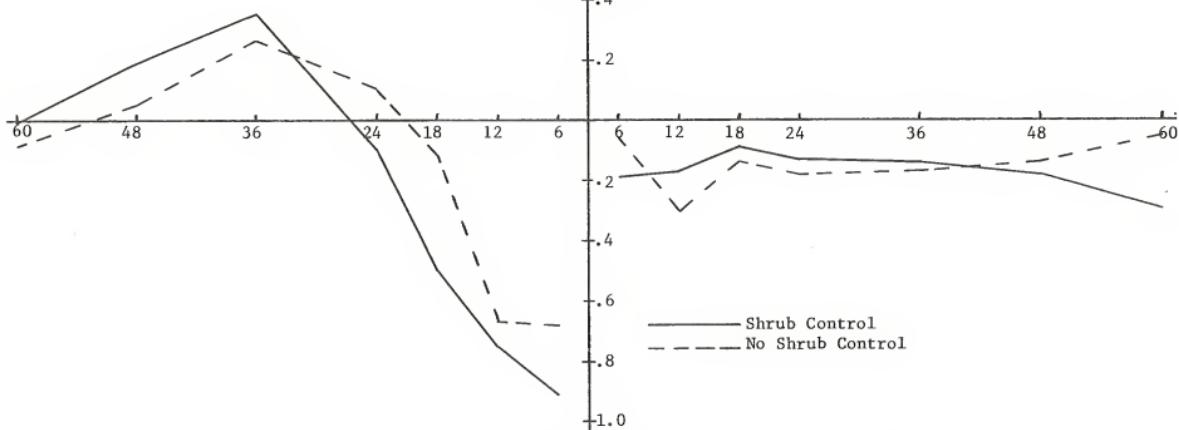


Figure 7. Early summer moisture change by depths from initial data (July 24, 1963) through December, 1966.

GRANITE MOUNTAIN EXCLOSURE

SMILO EXCLOSURE

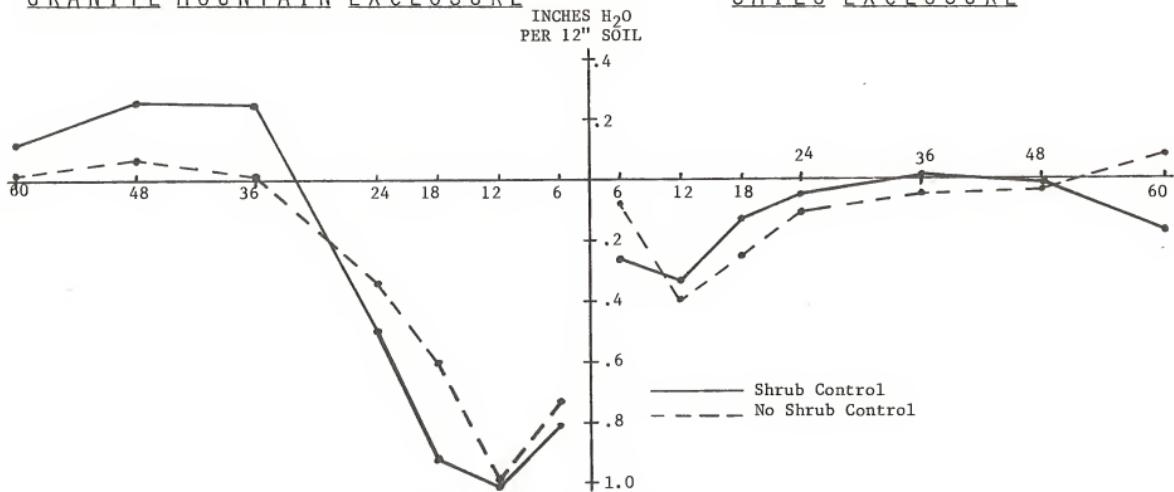


Figure 8. Summer moisture change by depths from initial data (July 24, 1963) through December, 1966.

GRANITE MOUNTAIN EXCLOSURE

SMILO EXCLOSURE

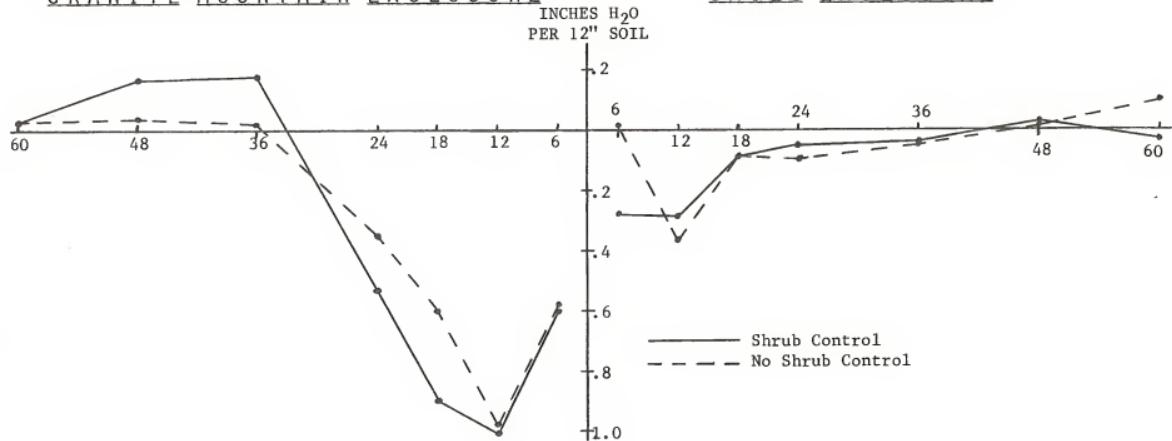


Figure 9. Fall moisture change by depths from initial data (July 24, 1963) through December, 1966.

GRANITE MOUNTAIN EXCLOSURE

SMILO EXCLOSURE

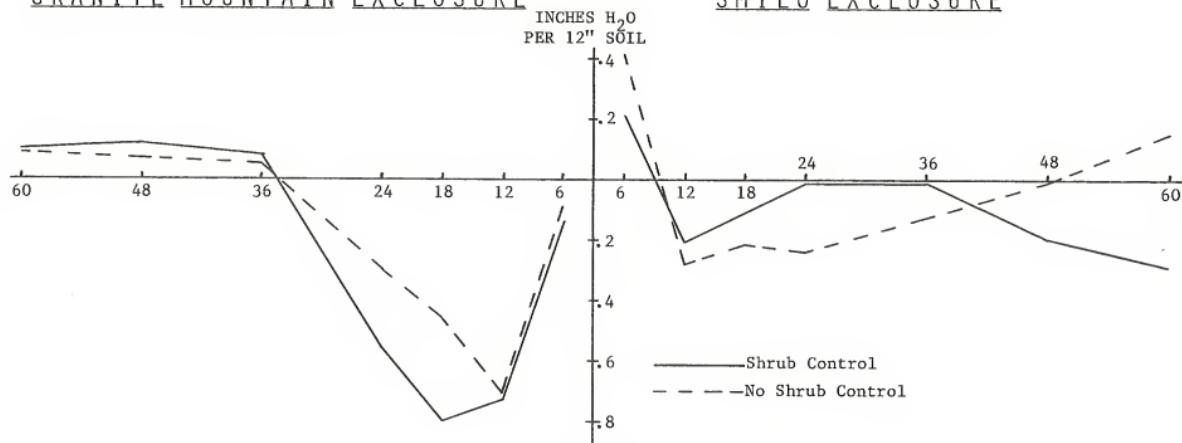


Figure 10. Winter moisture change by depths from initial data (July 24, 1963) through December, 1966.

## S E C T I O N      I I

### MICROCLIMATE STUDIES IN DESERT SHRUB TYPES

#### Introduction

Various studies have been made of salt desert areas. Of special interest have been the distinct boundaries between plant communities of almost pure stands of single species. Several workers (Gates, et al., 1956; Nichols, 1964; Mitchell, et al., 1966) have shown that certain soil properties are related to these distinct changes in plant communities but no one characteristic in itself is sufficient to cause this change. Each of these studies have hypothesized that the cause is apparently due to plant-soil moisture relationships since these recorded changes involve texture, salts, soil depth, and other soil factors associated with soil moisture. Therefore a University of Wyoming-Bureau of Land Management cooperative study was initiated in the Big Horn Basin of north central Wyoming in June, 1965, to determine soil moisture-soil temperature regimes of several salt desert plant communities.

In addition to soil moisture and soil temperature, other pertinent data which are known to affect soil moisture levels will also be collected. Such factors will include a grazing history of the area, water infiltration and permeability rates, range condition, soil profile descriptions, slope, exposure, precipitation, species composition and plant cover. Phenological observations will also be made throughout the year.

#### Location of Study Sites

The general study area is located on state and federal land generally north of Worland, Wyoming (Figure 1). Specifically, Study Area I is east of Manderson and contains two study communities; a Nuttall's saltbush (*Atriplex nuttallii* S. Wats.) community and a big sagebrush (*Artemesia tridentata* Nutt. subsp. *vaseyana* (Rydb.) Beetle) community. Area II is east of Highway 20 between Worland and Manderson and contains three study communities; a saltbush community, a big sagebrush community, and a bud sagebrush (*Artemesia spinescens* (D. C. Eat.)) community. Areas III and IV are located on the 15 Mile Creek drainage northwest of Worland. Area III is adjacent to the experimental steer pastures and has two study communities, a saltbush community and a birdfoot sagebrush (*Artemesia petatifida* Nutt.) community. Area IV has two study communities, a saltbush community and a spiny hopsage (*Grayia spinosa* (Hook) Msq.) community. Area V is northeast of Area II and contains a saltbush community and a winterfat (*Eurotia lanata* (Pursh) Msq.) community. This last mentioned area was installed in June, 1966, the others during June, 1965.

#### Climate of Big Horn Basin

The Big Horn Basin in which these study areas are located is surrounded by mountains on all sides except the North. These mountain ranges form an effective barrier to precipitation causing the air to drop much of its moisture before entering the basin. Long-term average annual precipitation for Worland is 7.76 inches, with the major portion occurring during the early part of the growing season during the months of April, May and June. This amounts to approximately 50 percent of the mean annual precipitation. Much of the moisture which falls during the latter part of the summer is lost by evaporation and much of the precipitation in the form of snow during the winter is lost by sublimation. Average snowfall is approximately 20 inches annually.

Late summer and early fall precipitation occurring in September and October may cause new growth of certain species of plants such as Nuttall's saltbush and some grass species. This is especially true when adequate moisture is associated with cool temperature.

Air temperatures show a wide range between winter and summer values. Mean monthly temperatures range from a January mean of 15.5°F. to a high of 72.0°F. in July. The annual mean temperature is 44.6°F. Daily temperature extremes have been recorded of 106°F. to -51°F.

The average date in the spring for the last temperature of 32°F. or lower is May 24. The average date of the first temperature of 32°F. or lower in the fall is September 23. Thus, there is an average growing season of approximately 132 days. Temperatures of less than 32°F. have been recorded as late as June 21 in the spring and as early as August 22 in the fall.

Nichols (1964) has shown that precipitation differences over the basin are small. This uniform rainfall pattern apparently rules out precipitation as a primary factor in determining distribution of vegetation.

Elevation of study areas range from 4,200 feet at the Manderson study area to 4,500 feet at the Burnt Wagon Study area.

#### Procedures

Three steel tubes, two inches in diameter, were installed to 5 feet at varying intervals within each plant community for soil moisture determinations. These determinations are made by a neutron scattering instrument at 6, 12, 18, 24, 36, 48 and 60 inch depths within each tube. Recordings were made monthly during the winter and twice monthly during the growing season (Table 1). These recordings were converted to inches of water per one foot of soil by use of a Philco 1600 computer. The 1965 and 1966 data are presented in this report by raw data (Table 1) and by means (Table 2).

Soil temperature measurements were read each time soil moisture recordings are made. Soil thermistors and a temperature sensing probe were used to record temperatures at 1, 8, 15 and 22 inch depths as recorded from a Tele-thermometer (Table 3).

Precipitation was determined by use of can type gauges. Recordings are made each time soil moisture and soil temperature determinations are measured (Table 4).

General data, concerning soil series, the range site and range condition as determined by Soil Conservation Service methods are presented in Table 5. This determination was made in September, 1965. Class of livestock using the area, the season of use, and the approximate stocking rates are presented in Table 6. These data were taken from records of the Bureau of Land Management. They encompass large areas, and therefore, may not apply specifically to the study sites.

#### 1965 Results

Study areas on 9 plant communities were established for precipitation, soil moisture, and soil temperature determinations. Six recordings were made in the period from June through early November.

Large variations in soil moisture were noted between plant communities. These differences are especially pronounced as comparisons of the various depths are considered.

Variations are noted in the temperatures of the many communities at various depths throughout the year. The shallow temperature determinations appear to be more a function of time of day and atmospheric temperature than actual between community differences.

#### 1966 Results

Soil moisture and soil temperature recordings were continued throughout 1966. A computer program to convert instrument recordings of soil moisture to inches of moisture per foot of soil was implemented. Wide variations in soil moisture were recorded during this below average moisture year.

Precipitation (Table 4) recordings indicate the amount received was roughly half that of the long term average. Large variations were noted in the amount of precipitation and was primarily due to high intensity rain showers in July.

Two additional communities were established near Shell, Wyoming, in June, 1966. Recordings were made at this study on the same dates that other communities were visited.

Other factors are currently being considered and several are in the process of being collected.

Figure 1. A geographical sketch of soil moisture-soil temperature study areas in the Big Horn Basin, Wyoming.

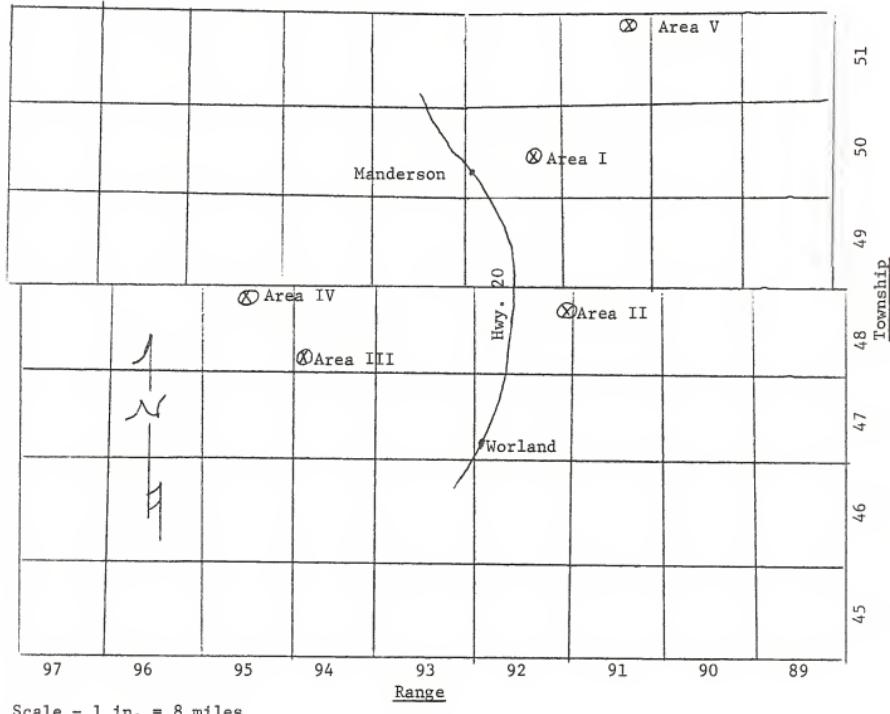


Table 1. Lists of recordings from the neutron scattering instrument by area, plant community, hole, depth and date of recording in 1965 and 1966.

Date	Area I Nuttall's Saltbush						
	6"	12"	18"	24"	36"	48"	60"
<u>Hole 1</u> <u>1965 Data</u>							
6-1-65	1340	1890	1960	2260	2230	2720	3090
7-6-65	950	1920	2030	2290	2410	2650	3000
8-1-65	1180	1840	2000	2390	2380	2750	2860
8-31-65	1290	1830	2090	2440	2400	2720	2920
9-30-65	3368	2210	2070	2440	2470	2690	3030
11-2-65	2550	2240	2130	2270	2400	2660	3050
<u>1966 Data</u>							
2-12-66	2130	2140	1960	2250	2380	2610	2890
3-11-66	2630	2090	2270	2410	2520	2940	3300
4-16-66	2470	2350	1990	2310	2390	2700	2900
4-30-66	2510	2300	2100	2420	2350	2680	3040
5-13-66	2200	2300	2150	2370	2510	2670	3030
6-9-66	1370	2080	2120	2420	2310	2710	3120
6-30-66	680	2070	2090	2330	2360	2630	2840
7-14-66	1360	1990	2060	2340	2360	2560	2930
8-2-66	1110	1980	2070	2340	2390	2650	2930
8-15-66	1320	1860	2140	2380	2430	2750	3000
8-29-66	1200	1860	2130	2420	2400	2660	2890
9-10-66	1190	1850	2170	2330	2350	2780	3090
10-22-66	1270	1810	2190	2400	2460	2800	3160
11-18-66	1220	1870	2180	2510	2470	2740	3100
12-17-66	1250	1980	2100	2370	2390	2670	3080
<u>Hole 2</u> <u>1965 Data</u>							
6-1-65	2040	2290	2350	2670	2730	3180	3580
7-6-65	1240	1920	1920	2200	2100	2540	2850
8-1-65	1280	1830	1970	2240	2350	2510	2870
8-31-65	1510	1820	2030	2250	2320	2580	2990
9-30-65	3990	2350	2010	2280	2200	2560	2850
11-2-65	2750	2370	2000	2260	2090	2590	2960

<u>Date</u>	<u>6"</u>	<u>12"</u>	<u>18"</u> <u>Hole 2 (cont.)</u>	<u>24"</u>	<u>36"</u>	<u>48"</u>	<u>60"</u>
<u>1966 Data</u>							
2-12-66	2060	2330	1870	2200	2160	2620	2960
3-11-66	2950	2050	2100	2330	2420	2670	3020
4-16-66	2390	2340	1940	2210	2160	2490	2980
4-30-66	2880	2330	2020	2200	2190	2580	2840
5-13-66	1750	2250	2050	2170	2280	2560	2860
6-9-66	1100	1960	2060	2140	2210	2510	2880
6-30-66	1430	1880	1860	2150	2140	2540	2860
7-14-66	1320	1930	1890	2190	2190	2470	2880
8-2-66	1240	1750	1880	2310	2200	2540	2940
8-15-66	1480	1870	1930	2210	2160	2570	2880
8-29-66	1240	1830	1930	2150	2240	2580	2870
9-10-66	1170	1840	1990	2190	2230	2470	2860
10-21-66	1220	1900	2030	2370	2260	2690	3090
11-18-66	1350	1800	1990	2340	2330	2710	2980
12-17-66	1290	1700	1950	2240	2160	2600	2880

Hole 3  
1965 Data

6-1-65	1692	2445	2808	2504	2519	2824	3053
7-6-65	1095	1906	2165	1996	1969	2207	2424
8-1-65	1218	1922	2163	2023	1934	2406	2532
8-31-65	1125	1977	2307	2089	2090	2304	2604
9-30-65	1865	1900	2293	2020	2086	2250	2492
11-2-65	1644	1976	2246	2161	1924	2275	2468

1966 Data

2-12-66	1280	1830	2160	2040	1930	2270	2570
3-11-66	1400	1970	2050	1930	2150	2520	2660
4-16-66	1560	1980	2290	2100	1990	2220	2470
4-30-66	1720	2050	2330	2060	2090	2330	2580
5-13-66	1420	1890	2300	2080	1980	2340	2500
6-9-66	1000	1930	2230	2020	1960	2280	2410
6-30-66	1270	1960	2280	2010	1970	2310	2480
7-14-66	1170	1880	2200	2080	2010	2260	2490
8-2-66	1030	1960	2320	2010	1960	2340	2460
8-15-66	1240	1950	2250	2010	1940	2380	2610
8-29-66	1110	1920	2140	1970	1990	2300	2440
9-10-66	1120	1810	2330	2030	1970	2320	2440
10-21-66	1230	1850	2430	2120	2120	2340	2790
11-18-66	1240	1890	2280	2090	2060	2310	2580
12-17-66	1160	1800	2190	2070	1960	2350	2490

Big Sagebrush  
Hole 1  
1965 Data

6-1-65	2252	2787	2402	2448	2426	2484	2436
7-6-65	1126	1802	1882	2042	1914	2036	2054
8-1-65	1087	1677	1852	1943	1942	2062	1977
8-31-65	1215	1638	1789	2022	1907	2015	2089
9-30-65	3274	3010	1990	1981	1859	2002	2019
11-2-65	2127	2603	2062	1979	1879	1982	2061

<u>Date</u>	<u>6"</u>	<u>12"</u>	<u>18"</u> <u>Hole 1 (cont.)</u>	<u>24"</u>	<u>36"</u>	<u>48"</u>	<u>60"</u>
<u>1966 Data</u>							
2-12-66	1560	2550	2030	2070	1940	2030	2050
3-11-66	2840	3770	2280	2100	1980	2170	2080
4-16-66	2640	3370	2670	2160	1940	2040	2030
4-30-66	2880	3390	2720	2180	1990	2100	2110
5-13-66	1920	2740	2670	2240	2010	2100	2030
6-9-66	670	1790	1960	2120	1940	2010	2040
6-30-66	1190	1630	1910	2070	1910	1970	2060
7-14-66	1170	1610	1770	1920	1870	2000	2000
8-2-66	890	1550	1740	1840	1800	1940	2110
8-15-66	1090	1560	1680	1850	1780	2060	2030
8-29-66	880	1580	1640	1840	1840	2030	2020
9-10-66	950	1560	1670	1850	1840	2030	2000
10-21-66	1020	1540	1650	1930	1850	2090	2110
11-18-66	1970	1530	1720	1860	1790	1990	2090
12-17-66	1770	1600	1690	1850	1800	2060	2120

Hole 2  
1965 Data

6-1-65	2415	2525	2516	2586	2594	2694	2943
7-6-65	1136	1822	1833	2042	2019	2232	2508
8-1-65	908	1638	1937	2002	1956	2289	2514
8-31-65	1059	1578	1892	1940	2058	2331	2454
9-30-65	3270	3852	3098	2048	2091	2352	2505
11-2-65	2244	3050	3075	2032	2081	2309	2386

1966 Data

2-12-66	1590	2850	3040	2240	1930	2260	2530
3-11-66	3030	3790	3160	2380	2060	2400	2470
4-16-66	2640	3400	3410	2420	2100	2370	2560
4-30-66	2940	3590	3650	2490	2040	2370	2520
5-13-66	1960	3060	3390	2510	2030	2310	2530
6-9-66	730	1840	2470	2350	2030	2340	2440
6-30-66	1030	1670	2110	2110	2020	2390	2400
7-14-66	1010	1690	2080	2080	2020	2260	2430
8-2-66	810	1530	1940	2010	2000	2260	2410
8-15-66	1070	1560	1920	2020	1960	2260	2520
8-29-66	920	1530	1860	1910	2030	2300	2430
9-10-66	790	1480	1920	1920	2020	2280	2430
10-21-66	850	1510	1890	2020	2070	2400	2520
11-19-66	910	1550	1870	2000	2040	2330	2480
12-17-66	930	1480	1980	1950	2030	2290	2430

Hole 3  
1965 Data

6-1-65	2495	2942	2486	2458	2619	2984	3045
7-6-65	1239	1863	2056	2082	2113	2282	2402
8-1-65	1056	1784	1929	2020	2073	2352	2432
8-31-65	1319	1682	1905	2045	2042	2392	2384
9-30-65	3342	3526	2554	2021	2080	2403	2413
11-2-65	2408	2967	2761	2073	2014	2476	2360

<u>Date</u>	<u>6"</u>	<u>12"</u>	<u>18"</u>	<u>24"</u>	<u>36"</u>	<u>48"</u>	<u>60"</u>
	<u>1966 Data</u>						
2-12-66	1750	2810	2680	2310	2100	2400	2380
3-11-66	2830	4510	4160	2540	2090	2420	2540
4-16-66	2820	3510	3560	3140	2130	2370	2380
4-30-66	3190	3630	3770	3170	2160	2420	2360
5-13-66	1990	2900	3200	2960	2210	2240	2440
6-9-66	1330	1790	2120	2380	2120	2290	2420
6-30-66	1260	1780	2020	2110	2090	2230	2340
7-14-66	1180	1780	1960	2110	2090	2350	2390
8-2-66	1050	1680	1910	1980	2010	2340	2350
8-15-66	1170	1620	1980	1950	2000	2220	2440
8-29-66	930	1580	1890	1930	1900	2260	2330
9-10-66	920	1540	1890	1830	1940	2390	2400
10-21-66	970	1540	1850	1950	2020	2300	2670
11-18-66	2470	1750	1860	1920	1890	2410	2490
12-17-66	2270	1690	1880	1960	1950	2360	2420

Area II  
Nuttall's Saltbush  
Hole 1  
1965 Data

6-8-65	1418	2519	2632	2729	2753	2393	2399
7-6-65	1073	2362	2523	2702	2640	2289	2259
8-1-65	932	2203	2444	2572	2622	2223	2224
8-31-65	962	2242	2679	2716	2808	2310	2412
10-2-65	3863	4627	3182	2723	2702	2354	2206

1966 Data

2-12-66	3030	3810	2870	2750	2460	2330	2320
3-11-66	2020	3860	3210	2720	2700	2500	2490
4-16-66	2140	3810	3080	2740	2690	2330	2450
4-30-66	2470	3860	3090	2720	2770	2310	2280
5-13-66	2250	3870	3210	2650	2790	2390	2300
6-10-66	1470	3640	2980	2810	2660	2470	2210
7-1-66	1440	3010	2960	2670	2730	2300	2340
7-15-66	1230	2700	2840	2790	2590	2350	2190
8-2-66	1120	2440	2690	2740	2600	2260	2180
8-16-66	1270	2480	2690	2680	2600	2270	2280
8-30-66	1160	2470	2610	2670	2650	2340	2280
9-10-66	1390	2470	2690	2600	2660	2270	2240
10-21-66	1170	2370	2710	2800	2750	2440	2330
11-18-66	1440	2400	2740	2650	2800	2310	2400
12-17-66	1420	2410	2670	2740	2750	2280	2260

Hole 2  
1965 Data

6-8-65	2168	2605	2815	3023	2574	2577	2467
7-6-65	2005	2683	2753	2832	2552	2564	2373
8-1-65	1675	2553	2902	2834	2602	2612	2302
8-31-65	1847	2646	2996	2942	2657	2633	2502
10-2-65	5251	4747	3384	2915	2528	2595	2356

<u>Date</u>	<u>6"</u>	<u>12"</u>	<u>18"</u> <u>1966 Data</u>	<u>24"</u>	<u>36"</u>	<u>48"</u>	<u>60"</u>
2-12-66	4200	3670	3040	2850	2580	2470	2540
3-11-66	3073	4100	3340	3060	2840	2790	2500
4-16-66	3690	3960	3160	2920	2630	2650	2330
4-30-66	3810	3770	3090	2860	2780	2650	2360
5-13-66	3790	3840	3180	3020	2680	2680	2440
6-10-66	2200	3850	3140	2880	2630	2520	2570
7-1-66	2910	3580	3120	2940	2720	2560	2370
7-15-66	2600	3390	3080	2880	2600	2490	2520
8-2-66	2420	3120	3150	2930	2590	2460	2380
8-16-66	2160	3080	3020	2850	2650	2510	2690
8-30-66	2090	2030	3080	3000	2630	2580	2530
9-10-66	2110	2990	3080	2880	2640	2560	2450
10-21-66	2190	2970	3130	3040	2700	2600	2680
11-18-66	2400	2880	2900	2920	2720	2630	2570
12-17-66	2300	2860	2900	2880	2680	2530	2420

Hole 3  
1965 Data

6-8-65	2065	2852	2853	3073	3633	4003	4152
7-6-65	1657	2846	2869	3083	3659	3889	4065
8-1-65	1557	2769	2907	3114	3662	3900	4186
8-31-65	1655	2722	2992	3118	3632	3916	4132
10-2-65	4108	4482	3256	3097	3523	3936	4359

1966 Data

2-12-66	3080	3430	2930	3060	3590	3980	4090
3-11-66	1860	3730	3140	3100	3590	3920	4100
4-16-66	2480	3420	3140	3240	3360	3910	4060
4-30-66	2900	3530	3110	3190	3710	3920	3920
5-13-66	2650	3560	3020	3110	3660	4060	4100
6-10-66	1170	3430	3070	3090	3680	4080	4130
7-1-66	2100	3300	3080	3120	3710	3960	4160
7-15-66	1960	3140	3020	3090	3480	3860	4120
8-2-66	1790	2950	3040	3160	3670	3890	4130
8-16-66	1820	2990	3060	3260	3710	3950	4080
8-30-66	1710	2840	3010	3110	3590	3880	4040
9-10-66	1810	2850	2920	3140	3610	3850	4220
10-21-66	1710	2930	3040	3180	3900	4090	4130
11-18-66	2140	2780	2980	3310	3800	3930	4310
12-17-66	2100	2790	2820	3140	3700	3880	4220

Bud Sagebrush

Hole 1  
1965 Data

6-8-65	1594	2546	2456	2393	3019	3416	3385
7-6-65	1284	2380	2440	2422	2775	3252	3133
8-1-65	1162	2358	2307	2243	2742	3222	3254
8-31-65	1305	2441	2396	2385	2905	3327	3376
10-2-65	3588	3388	2465	2331	2919	3246	3236

<u>Date</u>	<u>6"</u>	<u>12"</u>	<u>18"</u> <u>1966 Data</u>	<u>24"</u>	<u>36"</u>	<u>48"</u>	<u>60"</u>
2-12-66	2470	3110	2370	2230	2730	3150	3210
3-11-66	1640	3240	2630	2400	2920	3290	3530
4-16-66	2230	3060	2550	2320	2890	3180	3290
4-30-66	2480	3130	2520	2360	2790	3210	3350
5-13-66	1840	2910	2460	2480	2820	3240	3280
6-10-66	660	2400	2520	2330	2610	3200	3370
7-1-66	1470	2510	2450	2490	2800	3160	3310
7-15-66	1400	2320	2450	2330	2760	3050	3270
8-2-66	1330	2340	2320	2300	2740	3250	3310
8-16-66	1310	2320	2270	2450	2790	3050	3250
8-30-66	1300	2250	2370	2280	2890	3200	3280
9-10-66	1400	2170	2390	2280	2770	3200	3280
10-21-66	1420	2320	2460	2450	2870	3390	3480
11-18-66	2060	2280	2320	2430	2850	3290	3310
12-17-66	1890	2360	2300	2300	2880	3230	3270

Hole 2  
1965 Data

6-8-65	1432	2543	2468	2388	2635	3614	4064
7-6-65	1192	2395	2400	2372	2510	3383	3912
8-1-65	1128	2363	2412	2347	2558	3462	3826
8-31-65	1375	2349	2434	2438	2576	3502	4058
10-2-65	3761	3608	2525	2359	2540	3502	3981

1966 Data

2-12-66	1340	2940	2470	2350	2400	3310	3850
3-11-66	2140	3270	2640	2500	2420	3670	4160
4-16-66	2040	2980	3630	2380	2460	3420	4100
5-13-66	1740	2920	2560	2410	2440	3430	4000
6-10-66	700	2470	2570	2420	2430	3330	4030
7-1-66	1490	2490	2490	2400	2600	3560	3970
7-15-66	1380	2430	2450	2340	2460	3320	3980
8-2-66	1230	2400	2450	2350	2520	3420	3950
8-16-66	1340	2280	2370	2320	2560	3290	3880
8-30-66	1260	2260	2420	2320	2520	3380	3940
9-10-66	1320	2350	2380	2280	2540	3530	4040
10-21-66	1470	2440	2500	2440	2560	3600	4230
11-18-66	1830	2300	2530	2410	2530	3430	4100
12-17-66	1720	2250	2290	2300	2520	3480	4010

Hole 3  
1965 Data

6-8-65	1373	2726	2506	2256	2926	3188	3757
7-6-65	1206	2637	2453	2289	2866	3014	3769
8-1-65	1192	2444	2394	2333	2708	3026	3632
8-31-65	1243	2456	2422	2347	2936	3156	3818
10-2-65	3773	3859	2656	2289	2822	3064	3575

<u>Date</u>	<u>6"</u>	<u>12"</u>	<u>18"</u> <u>1966 Data</u>	<u>24"</u>	<u>36"</u>	<u>48"</u>	<u>60"</u>
2-12-66	2170	3180	2480	2250	2870	2980	3620
3-11-66	1180	3490	2870	2480	2740	3030	3660
4-16-66	1850	3360	2710	2260	2730	3040	3870
4-30-66	2030	3250	2580	2250	2790	2960	3660
5-13-66	Cork in hole						
6-10-66	550	2450	2680	2340	2580	3070	3710
7-1-66	1280	2590	2480	2220	2720	2870	3750
7-15-66	1330	2550	2390	2240	2670	3000	3650
8-2-66	1290	2440	2380	2280	2780	3000	3770
8-16-66	1340	2420	2350	2190	2750	2920	3710
8-30-66	1330	2370	2360	2270	2760	3100	3700
9-10-66	1410	2400	2370	2260	2820	3170	3810
10-21-66	1530	2400	2500	2350	2840	3150	3870
11-18-66	1590	2440	2280	2270	2890	3050	3810
12-17-66	1500	2400	2220	2140	2820	3090	3750

**Big Sagebrush**  
Hole 1  
1965 Data

6-8-65	1089	1919	2209	2133	2159	1875	2023
7-6-65	968	1832	2136	2247	2199	1889	2044
8-1-65	866	1735	2122	2144	2102	1977	2049
8-31-65	892	1732	2154	2252	2228	1931	2028
10-2-65	2856	3014	2188	2193	2068	1847	2043

1966 Data

2-12-66	1890	2380	2130	2200	2070	1870	1910
3-11-66	1430	2450	2290	2460	2230	1920	2010
4-16-66	1820	2240	2380	2310	2210	1860	2120
4-30-66	2010	2350	2300	2330	2190	1930	2020
5-13-66	1090	2140	2280	2400	2160	1840	2000
6-10-66	810	1680	2230	2250	2140	1890	1950
7-1-66	1030	1850	2170	2260	2110	1860	2060
7-15-66	920	1710	2140	2160	2120	1860	1940
8-2-66	960	1670	2150	2170	2150	1920	2050
8-16-66	860	1690	2040	2160	2070	1780	2050
8-30-66	900	1640	2070	2190	2140	1860	1950
9-10-66	1060	1650	2170	2220	2110	1850	1950
10-21-66	1220	1740	2100	2260	2270	1960	2110
11-18-66	1410	1740	2230	2180	2230	1860	2120
12-17-66	1400	1780	2060	2240	2160	1890	2010

Hole 2  
1965 Data

6-8-65	1168	1785	1924	2054	1872	2012	1789
7-6-65	1122	1625	1862	1925	1913	2007	1862
8-1-65	998	1602	1852	2029	1864	2002	1862
8-31-65	1048	1485	1818	1966	1898	2047	1912
10-2-65	2723	2817	2183	1972	1861	1927	1799

<u>Date</u>	<u>6"</u>	<u>12"</u>	<u>18"</u> <u>1966 Data</u>	<u>24"</u>	<u>36"</u>	<u>48"</u>	<u>60"</u>
2-12-66	2020	2270	2120	2140	1880	2130	1960
3-11-66	1910	2240	2330	2180	2140	2110	2090
4-16-66	1960	2080	2280	2210	1970	2130	2040
4-30-66	2160	2420	2350	2190	2090	2060	1990
5-13-66	1430	2000	2200	2170	1970	2090	1840
6-10-66	600	1700	1780	2100	1830	2020	1920
7-1-66	1100	1690	1930	2020	1930	2130	1920
7-15-66	890	1570	1840	1960	1880	1970	1900
8-2-66	950	1580	1750	1940	1840	1960	1840
8-16-66	940	1550	1780	1900	1860	1900	1840
8-30-66	950	1570	1840	1890	1840	1970	1830
9-10-66	1020	1550	1840	1900	1770	1950	1860
10-21-66	1210	1540	1860	1980	1920	1990	1890
11-18-66	1440	1630	1840	1900	1790	2020	1970
12-17-66	1370	1630	1780	1970	1810	1930	1850

Hole 3  
1965 Data

6-8-65	1742	1992	2225	2178	2074	2115	1949
7-6-65	1345	1775	2023	2172	2116	2174	2187
8-1-65	1212	1773	2033	2068	1978	2094	2032
8-31-65	1229	1733	2043	2161	2170	2195	2073
10-2-65	3304	2354	1952	2033	2036	2157	1988

1966 Data

2-12-66	2580	2230	2110	2090	2080	2270	2110
3-11-66	1890	2460	2070	2200	2090	2250	2080
4-16-66	2470	2090	2100	2220	2160	2180	1990
4-30-66	2730	2510	2150	2140	2080	2080	2070
5-13-66	1750	2120	2160	2120	2100	2150	1960
6-10-66	810	1840	2020	2150	2060	2120	2190
7-1-66	1440	1860	2020	2070	2010	2170	1990
7-15-66	1320	1700	2000	2060	1950	2180	2090
8-2-66	1170	1590	1910	2040	2060	2080	1950
8-16-66	1210	1710	1950	2000	2030	2200	2020
8-30-66	1150	1730	1940	2030	2130	2210	2060
9-10-66	1220	1680	1940	2070	1980	2080	2030
10-22-66	1280	1610	2040	2110	2130	2200	2190
11-18-66	1690	1610	2010	2120	2090	2240	2090
12-17-66	1690	1750	1880	1960	2050	2170	2050

Area III  
Birdfoot Sagebrush  
Hole 1  
1965 Data

6-2-65	1639	2729	2906	2952	3147	3002	3195
7-5-65	1552	2603	2973	2852	2989	2812	3167
8-1-65	1468	2779	2849	2855	2986	2748	2956
8-31-65	1237	2495	2929	2878	3096	2804	2089
9-30-65	3979	4454	3341	2800	2951	2779	3022
11-3-65	3120	3654	3145	2808	2848	2802	3155

<u>Date</u>	<u>6"</u>	<u>12"</u>	<u>18"</u> <u>1966 Data</u>	<u>24"</u>	<u>36"</u>	<u>48"</u>	<u>60"</u>
2-12-66	2350	3520	3170	2760	2850	2640	3110
3-11-66	1960	3710	3460	3030	3060	2840	3110
4-15-66	3550	4000	3210	2920	3000	2650	3160
4-29-66	3140	3790	3190	2860	2960	2900	3150
5-13-66	2330	3600	3210	2940	2990	3860	3120
6-9-66	1280	2830	3090	2870	2880	2630	3150
6-30-66	980	2860	2860	2840	2970	2750	3030
7-15-66	1640	2680	2990	2890	2980	2690	2980
8-3-66	1480	2600	3020	2890	2900	2790	3070
8-16-66	1690	2630	3060	2760	2840	2800	3040
8-30-66	1670	2640	3070	2780	2890	2780	3040
9-10-66	1590	2740	2980	2940	2840	2680	3140
10-22-66	1690	2700	2950	2920	3060	2790	3140
11-18-66	1740	2640	3080	2880	3010	2740	3190
12-17-66	1720	2640	2980	2790	3010	2730	3120

Hole 2  
1965 Data

6-2-65	1936	2974	3212	3468	3556	3464	3577
7-5-65	1637	2945	3102	3363	3472	3378	3636
8-1-65	1986	2999	3290	3378	3478	3427	3564
8-31-65	1535	2762	3148	3373	3492	3460	3672
9-30-65	5971	5358	4872	3914	3436	3366	3618
11-3-65	4545	4744	4293	3861	3430	3394	3581

1966 Data

2-12-66	4290	4460	4200	3660	3570	3370	3710
3-11-66	4000	4760	4170	3840	3720	3460	3860
4-15-66	4370	4770	4120	3740	3410	3350	3550
4-29-66	4010	4710	4140	3750	3520	3470	3530
5-13-66	3190	4480	4130	3780	3530	3380	3600
6-9-66	1810	3570	3980	3720	3490	3480	3700
6-30-66	2000	3400	3580	3690	3510	3440	3690
7-15-66	2090	3190	3520	3690	3320	3380	3670
8-3-66	1750	3000	3580	3470	3480	3450	3640
8-16-66	1920	3080	3440	3650	3480	3340	3620
8-30-66	1670	3020	3360	3490	3430	3330	3510
9-10-66	1630	2840	3440	3590	3460	3390	3610
10-22-66	2030	3080	3620	3660	3500	3540	3840
11-18-66	4360	3240	3480	3500	3380	3520	3870
12-17-66	3650	3150	3370	3670	3630	3320	3720

Hole 3  
1965 Data

6-2-65	1126	1848	2498	2548	2304	2814	2553
7-5-65	1192	1864	2370	2654	2402	2747	2504
8-1-65	1242	2222	2658	2602	2336	2782	2579
8-31-65	970	1872	2604	2735	2536	2895	2632
9-30-65	4342	3037	2576	2584	2264	2716	2582
11-3-65	3300	3030	2610	2603	2422	2874	2600

<u>Date</u>	<u>6"</u>	<u>12"</u>	<u>18"</u> <u>1966 Data</u>	<u>24"</u>	<u>36"</u>	<u>48"</u>	<u>60"</u>
2-12-66	3180	3010	2780	2750	2380	2960	2840
3-11-66	3270	3210	2660	2680	2590	2800	2820
4-15-66	3340	2890	2650	2570	2360	2740	2560
4-29-66	3010	2900	2760	2630	2460	2740	2610
5-13-66	2410	2880	2770	2590	2440	2840	2640
6-9-66	1190	2560	2800	2550	2530	2920	2670
6-30-66	910	2290	2880	2720	2490	2650	2690
7-15-66	1070	2160	2890	2600	2440	2800	2650
8-3-66	1000	2130	2800	2610	2410	2760	2630
8-16-66	1190	2060	2760	2600	2370	2810	2660
8-30-66	1050	2010	2700	2640	2430	2870	2640
9-10-66	940	2010	2690	2650	2430	2890	2600
10-22-66	1220	2110	2820	2800	2510	2820	2800
11-18-66	1150	1990	2710	2720	2370	2950	2670
12-17-66	1050	1990	2710	2740	2500	2840	2720

**Nuttall's Saltbush**  
Hole 1  
1965 Data

6-2-65	1176	2213	2656	2749	3479	3378	3146
7-5-65	1063	2159	2649	2516	3416	3350	2914
8-1-65	1442	2579	2562	2913	3360	3263	2993
8-31-65	999	2149	2622	2656	3342	3452	3158
9-30-65	1638	2123	2641	2615	3304	3425	3068
11-3-65	1226	2083	2624	2576	3394	3367	3155

1966 Data

2-12-66	1110	2060	2450	2600	3270	3190	3030
3-11-66	920	2160	2780	2730	3470	3470	3330
4-15-66	1680	2120	2750	2510	3390	3200	3170
4-29-66	1570	2070	2510	2590	3260	3230	3040
5-13-66	1340	2210	2660	2590	3440	3440	3170
6-9-66	1180	2240	2630	2600	3310	3370	2870
6-30-66	690	1980	2650	2460	3290	3380	3120
7-15-66	1000	2190	2590	2470	3230	3310	3080
8-3-66	1030	2170	2740	2560	3400	3310	3060
8-15-66	1400	2160	2560	2550	3330	3340	3040
8-30-66	1000	2140	2620	2590	3220	3320	2930
9-10-66	1030	2160	2570	2570	3310	3280	3100
10-22-66	1200	2180	2740	2640	3460	3370	3190
11-18-66	1110	2240	2550	2590	3250	3260	3140
12-17-66	1060	2180	2520	2500	3350	3350	3040

Hole 2  
1965 Data

6-2-65	1609	2889	3474	3025	3518	4148	3953
7-5-65	1319	2652	3300	2813	3386	3974	3896
8-1-65	1603	3300	3076	2876	3572	3876	3937
8-31-65	1243	2874	3329	2927	3493	3892	3997
9-30-65	2372	2880	3280	2869	3404	3917	3923
11-3-65	1988	2746	3330	2965	3362	3928	3875

<u>Date</u>	<u>6"</u>	<u>12"</u>	<u>18"</u> <u>1966 Data</u>	<u>24"</u>	<u>36"</u>	<u>48"</u>	<u>60"</u>
2-12-66	1770	2940	3080	2870	3610	3950	4010
3-11-66	1010	2640	3460	3080	3710	4060	4010
4-15-66	1840	2680	3310	2930	3410	3930	3950
4-29-66	1480	2770	3070	2870	3490	3960	4000
5-13-66	1470	2830	3170	2960	3430	3910	4000
6-9-66	880	2230	3180	2970	3500	3810	4060
6-30-66	700	2410	3220	3000	3600	3850	3920
7-15-66	1510	2660	3150	3070	3470	3800	3970
8-3-66	1340	2580	3130	2980	3300	3720	4040
8-15-66	1580	2730	3220	2970	3440	3810	4020
8-30-66	1390	2630	3180	2810	3450	3830	3910
9-10-66	1430	2500	3210	2950	3420	3870	4050
10-22-66	3460	3490	3330	3080	3520	3970	4140
11-18-66	2420	3320	3320	2930	3550	3970	4210
12-17-66	2360	3110	3220	2900	3380	3920	4120

Hole 3  
1965 Data

6-2-65	1724	2857	3663	3254	3743	4134	3859
7-5-65	1488	3034	3538	3092	3602	3955	3722
8-1-65	1464	3307	3434	2884	3392	4022	3705
8-31-65	1323	2902	3422	3028	3640	4170	3929
9-30-65	1394	2884	3355	3077	3470	4097	3723
11-3-65	1408	2632	3290	3096	3671	4010	3843

1966 Data

2-12-66	1510	2820	3280	2940	3790	4150	3790
3-11-66	1020	2310	3460	3300	3560	4200	3970
4-15-66	1240	2470	3160	3000	3410	4140	3770
4-29-66	1200	2630	3200	3000	3500	4200	3810
5-13-66	1130	2600	3340	3090	3530	4030	3890
6-9-66	950	2260	3250	3130	3300	4100	3910
6-30-66	710	2560	3300	2970	3520	4020	3870
7-15-66	6350	5200	3370	2960	3510	4090	3860
8-3-66	4060	4760	3380	2930	3490	4130	3800
8-15-66	3880	4570	3500	3020	3630	3940	3930
8-30-66	2980	4490	3490	2920	3610	4060	3920
9-10-66	5110	5100	3530	2980	3610	3970	3990
10-22-66	4190	4680	3650	2960	3660	4140	4110
11-18-66	3820	4380	3450	2940	3560	4140	3930
12-17-66	3730	4130	3370	2980	3590	4100	3790

Area IV  
Nuttall's Saltbush  
Hole 1  
1965 Data

6-3-65	2276	2882	3462	3219	3367	3672	3734
7-5-65	1878	2880	3446	3106	3155	3592	3782
8-1-65	1982	3248	3277	3102	3235	3472	3662
8-31-65	1652	2728	3471	3349	3193	3495	3763
9-30-65	2703	2727	3400	3124	3269	3577	3851

<u>Date</u>	<u>6"</u>	<u>12"</u>	<u>18"</u> <u>1966 Data</u>	<u>24"</u>	<u>36"</u>	<u>48"</u>	<u>60"</u>
2-12-66	1980	2700	3330	3070	3130	3500	3750
3-11-66	930	2620	3440	3430	3350	3680	3800
4-15-66	2460	2950	3310	3270	3300	3660	3760
4-29-66	2370	2680	3380	3080	3160	3420	3650
5-13-66	1900	2780	3370	3190	3210	3590	3650
6-9-66	1380	2470	3480	3280	3190	3530	3800
6-30-66	1050	2840	3330	3130	3160	3650	3740
7-15-66	2460	2860	3380	3160	3290	3530	3770
8-3-66	1880	2820	3390	3140	3160	3640	3780
8-16-66	2260	2840	3540	3070	3300	3510	3900
8-30-66	1810	2720	3460	3150	3230	3620	3850
9-10-66	1680	2970	3420	3200	3270	3640	3910
10-22-66	1980	2890	3590	3110	3290	3770	4060
11-18-66	1750	2670	3340	3120	3220	3430	3760
12-17-66	1660	2620	3320	3110	3180	3440	3740

Hole 2  
1965 Data

6-3-65	2139	2747	3403	3104	3426	3655	3408
7-5-65	2002	2682	3169	3200	3283	3343	3442
8-1-65	2236	2997	3194	3289	3295	3604	3469
8-31-65	1818	2730	3052	3238	3334	3489	3616
9-30-65	2982	2755	2993	3204	3278	3474	3501

1966 Data

2-12-66	2080	2690	2950	3030	3200	3490	3500
3-11-66	1360	2660	3120	3350	3360	3570	3900
4-15-66	2910	2760	3000	3200	3230	3390	3530
4-29-66	2690	2670	2980	3130	3370	3500	3660
5-13-66	2200	2770	2990	3170	3210	3510	3680
6-9-66	1460	2680	3060	3040	3260	3640	3540
6-30-66	820	2450	3040	3130	3260	3400	3410
7-15-66	1860	2580	3090	2990	3270	3440	3590
8-3-66	1760	2540	3060	3090	3130	3330	3520
8-16-66	1790	2660	3000	3120	3180	3350	3460
8-30-66	1690	2520	3040	3060	3290	3470	3490
9-10-66	1570	2620	3040	3010	3120	3480	3450
10-22-66	1700	2640	3130	3030	3330	3560	3610
11-18-66	1660	2610	2950	3030	3380	3370	3470
12-17-66	1680	2480	2990	3070	3140	3390	3460

Hole 3  
1965 Data

6-3-65	2162	2752	3278	3182	3209	3442	3449
7-5-65	2097	3539	3450	3367	3487	3463	3753
8-1-65	4004	3747	3357	3537	3384	3542	3857
8-31-65	1960	3477	3505	3566	3533	3480	3849
9-30-65	2757	3328	3550	3382	3367	3486	3824

<u>Date</u>	<u>6"</u>	<u>12"</u>	<u>18"</u> <u>1966 Data</u>	<u>24"</u>	<u>36"</u>	<u>48"</u>	<u>60"</u>
2-12-66	2300	3260	3300	3370	3420	3630	3870
3-11-66	1540	3320	3660	3500	3710	3660	4080
4-15-66	2540	3380	3530	3320	3560	3440	3890
4-29-66	2310	3310	3500	3420	3460	3460	3920
5-13-66	1980	3330	3300	3210	3450	3440	3740
6-9-66	1630	3250	3390	3260	3320	3550	3750
6-30-66	1550	3330	3420	3360	3460	3490	3770
7-15-66	4680	3740	3390	3310	3450	3450	3750
8-3-66	2560	3410	3390	3270	3360	3360	3800
8-16-66	2520	3380	3380	3310	3310	3430	3920
8-30-66	2080	3270	3520	3410	3470	3630	3780
9-10-66	2010	3300	3400	3340	3450	3590	3890
10-22-66	2080	3370	3460	3380	3510	3610	3910
11-18-66	1960	3170	3510	3250	3320	3540	3730
12-17-66	1850	3120	3270	3210	3380	3390	3740

Spiny Hopsege

Hole 1  
1965 Data

6-3-65	592	1104	1282	1359	1239	1122	1084
7-5-65	682	1146	1253	1345	1345	1312	1372
8-1-65	754	1214	1265	1267	1412	1294	1337
8-31-65	609	1034	1310	1317	1404	1280	1373
9-30-65	2047	2860	2767	1597	1390	1328	1388

1966 Data

2-12-66	1360	2250	2360	1710	1300	1310	1330
3-11-66	2280	3370	2960	1960	1480	1380	1460
4-15-66	1870	2780	2870	2150	1420	1250	1320
4-29-66	1680	2600	2770	2040	1340	1270	1350
5-13-66	1120	1900	2200	2110	1330	1280	1300
6-9-66	640	1160	1320	1410	1380	1270	1420
6-30-66	560	1060	1220	1280	1340	1330	1360
7-15-66	610	1000	1270	1280	1400	1280	1370
8-3-66	760	1060	1260	1290	1390	1280	1370
8-16-66	630	1000	1250	1310	1360	1310	1370
8-30-66	510	1020	1220	1330	1370	1320	1400
9-10-66	540	1030	1250	1280	1400	1280	1370
10-22-66	590	1030	1270	1370	1390	1320	1380
11-18-66	2040	1690	1320	1240	1330	1280	1410
12-17-66	1680	1760	1330	1320	1360	1280	1420

Hole 2  
1965 Data

6-3-65	837	1403	1418	1332	1082	999	1342
7-5-65	1072	1349	1392	1447	1265	1292	1569
8-1-65	846	1342	1432	1324	1192	1275	1652
8-31-65	722	1185	1373	1328	1324	1237	1547
9-30-65	Cork stuck						

<u>Date</u>	<u>6"</u>	<u>12"</u>	<u>18"</u>	<u>24"</u>	<u>36"</u>	<u>48"</u>	<u>60"</u>
	<u>1966 Data</u>						
2-12-66	Cork stuck						
3-11-66	2410	3950	4070	3130	2170	1570	1600
4-15-66	2190	3100	3540	3320	2260	1520	1580
4-29-66	2010	2810	3340	3080	2220	1400	1530
5-13-66	1280	2140	2620	2630	2100	1470	1510
6-9-66	650	1370	1500	1530	1470	1410	1610
6-30-66	400	1290	1460	1340	1290	1280	1600
7-15-66	1430	1320	1430	1410	1320	1210	1600
8-3-66	1100	1380	1510	1380	1300	1280	1610
8-16-66	950	1330	1370	1340	1310	1270	1710
8-30-66	710	1210	1380	1350	1270	1220	1580
9-10-66	800	1280	1360	1400	1270	1230	1680
10-22-66	660	1270	1390	1340	1260	1190	1610
11-18-66	1180	1300	1420	1420	1280	1220	1560
12-17-66	1140	1300	1300	1400	1240	1230	1590

Hole 3  
1965 Data

6-3-65	1042	1829	1757	1646	1494	1705	2985
7-5-65	1209	1982	2253	1929	1724	2105	3645
8-1-65	1457	2059	2017	1788	1904	2057	3854
8-31-65	978	1845	2233	1926	1887	2099	3454
9-30-65	2970	4390	3521	2002	1810	2059	3575

1966 Data

2-12-66	2120	3750	3510	2240	2800	2090	3850
3-11-66	2570	4110	3660	2280.	1890	2170	3370
4-15-66	2360	4100	3870	2530	1770	2050	3130
4-29-66	1940	3810	3900	2420	1840	1990	3170
5-13-66	1220	2840	3280	2430	1770	2060	3170
6-9-66	940	2120	2390	2190	1800	2050	3430
6-30-66	610	1880	2280	2150	1830	2040	3290
7-15-66	1150	1890	2260	2030	1810	2020	3320
8-3-66	1340	1890	2290	2050	1820	2100	3440
8-16-66	1250	1930	2260	2120	1800	2080	3660
8-30-66	950	1820	2230	2030	1860	2030	3540
9-10-66	950	1920	2250	1990	1780	2050	3630
10-22-66	960	1820	2180	1990	1810	2090	3590
11-18-66	960	1910	2240	1990	1790	2010	3560
12-17-66	970	1820	2100	1940	1710	2000	3500

Area V  
Nuttall's Saltbush  
Hole 1  
1966 Data

6-9-66	1640	1860	2010	2280	2480	2370	2430
6-30-66	1300	1980	1910	2080	2120	2440	2380
7-14-66	1160	1630	1740	2100	2470	2380	2340
8-2-66	1200	1640	1730	2020	2330	2390	2310
8-15-66	1260	1610	1830	2010	2530	2440	2420
8-29-66	1150	1540	1720	2020	2440	2380	2320
9-9-66	1140	1450	1670	2100	2430	2350	2490
10-22-66	1230	1670	1900	2200	2640	2590	2600
11-18-66	1610	1560	1790	2000	2510	2480	2530
12-17-66	1540	1570	1730	2050	2450	2420	2430

<u>Date</u>	<u>6"</u>	<u>12"</u>	<u>18"</u>	<u>24"</u>	<u>36"</u>	<u>48"</u>	<u>60"</u>
<u>Hole 2</u> <u>1966 Data</u>							
6-9-66	1480	2100	1960	2130	2200	2340	2410
6-30-66	1330	1980	1910	2080	2120	2440	2380
7-14-66	1270	1810	1790	2050	2090	2430	2270
8-3-66	1060	1760	1760	2020	2230	2400	2320
8-15-66	1340	1740	1820	2000	2080	2390	2390
8-29-66	1260	1630	1770	2060	2160	2370	2330
9-9-66	1190	1580	1730	2020	2180	2440	2440
10-22-66	1230	1580	1790	2120	2280	2490	2600
11-18-66	3200	1770	1790	2080	2150	2430	2470
12-17-66	2680	1790	1840	2030	2170	2440	2460

Hole 3  
1966 Data

6-9-66	1680	2170	1990	2090	2310	2290	2410
6-30-66	1420	1910	2050	1880	2300	2170	2280
7-14-66	1260	1980	1940	1980	2380	2120	2210
8-3-66	1260	1840	1970	2000	2380	2170	2400
8-15-66	1470	1820	1850	1970	2340	2100	2330
8-29-66	1270	1880	1850	1900	2280	2130	2350
9-9-66	1340	1840	1950	1860	2290	2090	2300
10-22-66	1260	1970	1990	2020	2340	2250	2430
11-18-66	1640	1940	1940	1930	2300	2230	2410
12-17-66	1620	1880	1920	1990	2330	2170	2310

Winterfat  
Hole 1  
1966 Data

6-9-66	1300	2230	2350	2410	2510	2440	2500
6-30-66	1290	1850	2140	2140	2730	2490	2510
7-14-66	1140	1770	2110	2370	2520	2440	2480
8-2-66	1100	1660	2060	2370	2520	2490	2410
8-15-66	1250	1630	2030	2280	2480	2410	2430
8-29-66	1150	1650	2070	2370	2590	2510	2570
9-9-66	1090	1530	2080	2200	2460	2350	2440
10-22-66	1210	1640	2290	2350	2740	2630	2530
11-18-66	1350	1600	2150	2250	2490	2580	2460
12-17-66	1340	1590	1990	2290	2470	2500	2490

Hole 2  
1966 Data

6-9-66	1640	2170	2040	2430	2340	2940	2510
6-30-66	1690	2120	2030	2450	2410	2780	2590
7-14-66	1690	2000	1980	2330	2350	2820	2540
8-2-66	1510	1930	1960	2260	2330	2790	2430
8-15-66	1690	1850	1980	2270	2370	2800	2440
8-29-66	1730	1840	2010	2320	2330	2880	2480
9-9-66	1560	1810	2290	2290	2290	2770	2570
10-22-66	1740	1990	2040	2380	2610	2950	2750
11-18-66	2040	1890	1960	2290	2480	2910	2650
12-17-66	2060	1860	1980	2240	2360	2790	2430

<u>Date</u>	<u>6"</u>	<u>12"</u>	<u>18"</u> <u>Hole 3</u> <u>1966 Data</u>	<u>24"</u>	<u>36"</u>	<u>48"</u>	<u>60"</u>
6-9-66	1770	2190	2130	2300	2390	2420	2300
6-30-66	1420	2120	2170	2310	2340	2610	2180
7-14-66	1370	2050	2130	2270	2330	2460	2120
8-2-66	1260	1910	2020	2220	2180	2450	2070
8-15-66	1360	1900	2030	2310	2240	2480	2150
8-29-66	1290	1740	2020	2230	2220	2500	2100
9-9-66	1290	1900	2050	2330	2230	2460	2170
10-22-66	1370	1870	2030	2340	2500	2590	2310
11-18-66	1510	1910	2090	2370	2340	2640	2240
12-17-66	1490	1770	1970	2260	2310	2510	2180

TABLE 2. Soil moisture means summarized over three tubes in each community.  
Data expressed as inches of moisture per foot of soil by depths and years.

Date	Community									
	Area I		Area II			Area III		Area IV		Area V
	Salt- bush	Big Sage	Salt- bush	Big Sage	Bud	Salt- bush	Brown	Salt- bush	Spiny Hopsage	Salt- bush
<u>6" Depth</u>										
1965 Data										
June 1	1.44	1.78	1.53	1.26	1.33	1.34	1.38	1.69	1.01	
July 6	1.14	1.18	1.38	1.17	1.21	1.24	1.32	1.59	1.09	
Aug. 1	1.21	1.10	1.29	1.11	1.17	1.34	1.38	1.96	1.10	
Aug. 31	1.25	1.19	1.34	1.12	1.25	1.19	1.22	1.50	0.98	
Sept. 30	2.13	2.24	2.79	2.07	2.44	1.49	2.97	2.00	1.43	
Nov. 2	1.75	1.72	--	--	--	1.36	2.42	--	--	
1966 Data										
Feb. 12	1.50	1.41	2.31	1.67	1.59	1.33	2.23	1.65	1.17	
Mar. 11	1.75	2.04	1.75	1.46	1.42	1.09	2.13	1.23	1.80	
Apr. 16	1.66	1.94	1.98	1.63	1.61	1.39	2.46	1.91	1.66	
Apr. 30	1.78	2.09	2.12	1.74	1.73	1.30	2.28	1.82	1.53	
May 13	1.49	1.57	2.04	1.31	1.19	1.25	1.91	1.61	1.20	
June 9	1.17	1.05	1.40	0.97	0.91	1.10	1.31	1.34	0.97	1.39
June 30	1.16	1.17	1.67	1.19	1.30	0.95	1.24	1.16	0.86	1.27
July 14	1.24	1.15	1.56	1.12	1.28	2.07	1.39	2.09	1.13	1.21
Aug. 2	1.16	1.05	1.48	1.11	1.24	1.66	1.30	1.63	1.13	1.18
Aug. 15	1.27	1.15	1.47	1.10	1.26	1.73	1.39	1.69	1.07	1.27
Aug. 29	1.19	1.05	1.42	1.09	1.24	1.49	1.33	1.52	0.96	1.21
Sept. 10	1.17	1.04	1.48	1.14	1.28	1.85	1.29	1.47	0.98	1.21
Oct. 21	1.21	1.07	1.44	1.21	1.33	2.06	1.42	1.55	0.96	1.23
Nov. 18	1.23	1.48	1.59	1.35	1.51	1.82	1.80	1.49	1.29	1.67
Dec.	1.02	1.42	1.56	1.34	1.39	1.78	1.66	1.46	1.23	1.57
<u>12" Depth</u>										
1965 Data										
June 1	1.36	1.63	1.59	1.21	1.56	1.59	1.52	1.66	0.99	
July 6	1.22	1.18	1.57	1.13	1.50	1.57	1.50	1.78	1.01	
Aug. 1	1.19	1.11	1.51	1.11	1.45	1.79	1.59	1.92	1.03	
Aug. 31	1.20	1.08	1.53	1.09	1.47	1.58	1.45	1.75	0.94	
Sept. 30	1.34	1.99	2.56	1.62	2.07	1.57	2.40	1.73	1.47	
Nov. 2	1.36	1.70	--	--	--	1.50	2.16	--	--	
1966 Data										
Feb. 12	1.31	1.63	2.08	1.41	1.80	1.56	2.09	1.70	1.26	
Mar. 11	1.28	2.27	2.20	1.45	1.92	1.45	2.20	1.69	2.16	
Apr. 16	1.37	1.97	2.12	1.33	1.83	1.47	2.20	1.77	1.92	
Apr. 30	1.37	2.03	2.12	1.47	1.82	1.50	2.16	1.70	1.80	
May 13	1.33	1.71	2.14	1.30	1.23	1.53	2.08	1.74	1.41	

12" Depth Cont.  
1966 Data

June	9	1.26	1.17	2.08	1.13	1.48	1.38	1.75	1.66	1.04	1.28	1.36
June	30	1.25	1.11	1.91	1.16	1.52	1.42	1.68	1.70	0.97	1.24	1.28
July	14	1.23	1.11	1.80	1.09	1.48	1.93	1.60	1.79	0.96	1.17	1.23
Aug.	2	1.21	1.06	1.68	1.07	1.46	1.84	1.55	1.72	0.98	1.14	1.18
Aug.	15	1.21	1.05	1.68	1.09	1.43	1.83	1.55	1.74	0.97	1.12	1.16
Aug.	29	1.20	1.04	1.48	1.09	1.41	1.80	1.54	1.68	0.94	1.10	1.13
Sept.	10	1.18	1.03	1.64	1.08	1.41	1.88	1.52	1.74	0.97	1.07	1.14
Oct.	21	1.19	1.03	1.64	1.08	1.45	1.98	1.57	1.74	0.95	1.13	1.18
Nov.	18	1.19	1.07	1.60	1.09	1.43	1.91	1.57	1.67	1.08	1.14	1.16
Dec.		1.17	1.06	1.60	1.12	1.43	1.83	1.56	1.63	1.08	1.14	1.13

18" Depth  
1965 Data

June	1	1.45	1.49	1.64	1.32	1.50	1.89	1.70	1.95	1.01		
July	6	1.28	1.22	1.62	1.26	1.48	1.84	1.67	1.94	1.08		
Aug.	1	1.28	1.21	1.63	1.26	1.45	1.77	1.73	1.90	1.05		
Aug.	31	1.33	1.19	1.70	1.26	1.47	1.82	1.71	1.93	1.08		
Sept.	30	1.32	1.53	1.90	1.31	1.53	1.80	2.06	1.92	1.31		
Nov.	2	1.32	1.58	--	--	--	1.80	1.93	--	--		

1966 Data

Feb.	12	1.26	1.55	1.73	1.32	1.48	1.73	1.95	1.85	1.24		
Mar.	11	1.33	1.86	1.87	1.38	1.62	1.87	1.97	1.96	2.04		
Apr.	16	1.30	1.86	1.82	1.39	1.74	1.80	1.92	1.90	1.97		
Apr.	30	1.34	1.95	1.81	1.39	1.53	1.72	1.94	1.90	1.93		
May	13	1.34	1.80	1.83	1.37	1.10	1.79	1.94	1.87	1.61		
June	9	1.33	1.35	1.79	1.27	1.55	1.77	1.90	1.91	1.13	1.25	1.35
June	30	1.30	1.27	1.79	1.28	1.50	1.79	1.81	1.89	1.09	1.24	1.32
July	14	1.29	1.23	1.75	1.26	1.48	1.78	1.83	1.90	1.09	1.17	1.30
Aug.	2	1.31	1.19	1.74	1.23	1.45	1.80	1.83	1.90	1.11	1.17	1.27
Aug.	15	1.31	1.19	1.72	1.22	1.43	1.81	1.80	1.91	1.08	1.18	1.27
Aug.	29	1.29	1.16	1.71	1.24	1.45	1.81	1.78	1.93	1.07	1.15	1.28
Sept.	10	1.34	1.17	1.71	1.25	1.45	1.81	1.78	1.90	1.07	1.15	1.33
Oct.	21	1.37	1.16	1.74	1.26	1.50	1.88	1.82	1.95	1.07	1.21	1.32
Nov.	18	1.34	1.17	1.70	1.27	1.45	1.81	1.80	1.89	1.09	1.18	1.29
Dec.		1.30	1.19	1.66	1.21	1.40	1.78	1.77	1.85	1.05	1.18	1.25

24" Depth  
1965 Data

June	1	1.50	1.51	1.73	1.32	1.43	1.76	1.75	1.84	0.99		
July	6	1.34	1.29	1.70	1.32	1.44	1.66	1.74	1.87	1.05		
Aug.	1	1.37	1.26	1.68	1.30	1.41	1.70	1.73	1.91	0.99		
Aug.	31	1.39	1.26	1.72	1.32	1.46	1.69	1.76	1.95	1.02		
Sept.	30	1.38	1.27	1.71	1.29	1.42	1.69	1.81	1.88	0.86		
Nov.	2	1.38	1.28	--	--	--	1.70	1.80	--	--		

24" Depth Cont.  
1966 Data

Feb.	12	1.34	1.36	1.70	1.33	1.40	1.66	1.79	1.84	0.92	
Mar.	11	1.37	1.43	1.74	1.40	1.49	1.78	1.85	1.97	1.49	
Apr.	16	1.36	1.55	1.74	1.38	1.42	1.67	1.80	1.89	1.59	
Apr.	30	1.37	1.57	1.72	1.37	1.42	1.67	1.80	1.86	1.52	
May	13	1.36	1.54	1.72	1.38	1.08	1.70	1.81	1.85	1.46	
June	9	1.36	1.40	1.72	1.34	1.44	1.71	1.78	1.85	1.12	1.34
June	30	1.34	1.31	1.71	1.32	1.45	1.66	1.80	1.86	1.06	1.27
July	14	1.36	1.28	1.72	1.29	1.41	1.68	1.79	1.83	1.05	1.28
Aug.	2	1.37	1.23	1.73	1.29	1.42	1.67	1.75	1.84	1.05	1.27
Aug.	15	1.36	1.23	1.72	1.27	1.42	1.68	1.76	1.84	1.06	1.26
Aug.	29	1.35	1.21	1.72	1.28	1.41	1.65	1.74	1.86	1.05	1.26
Sept.	10	1.35	1.19	1.70	1.29	1.40	1.68	1.79	1.85	1.04	1.26
Oct.	21	1.41	1.24	1.76	1.32	1.47	1.71	1.82	1.84	1.05	1.32
Nov.	18	1.42	1.22	1.74	1.29	1.45	1.67	1.78	1.83	1.04	1.26
Dec.		1.37	1.22	1.72	1.29	1.38	1.67	1.79	1.82	1.04	1.27
											1.39

36" Depth  
1965 Data

June	1	1.51	1.53	1.75	1.28	1.69	2.05	1.76	1.92	0.90	
July	6	1.34	1.27	1.73	1.30	1.62	1.99	1.74	1.91	0.98	
Aug.	1	1.37	1.26	1.74	1.25	1.59	1.98	1.73	1.91	1.01	
Aug.	31	1.40	1.26	1.77	1.31	1.66	2.00	1.78	1.93	1.03	
Sept.	30	1.39	1.27	1.72	1.26	1.64	1.95	1.70	1.91	0.80	
Nov.	2	1.33	1.26	--	--	--	2.00	1.71	--	--	

1966 Data

Feb.	12	1.34	1.26	1.70	1.27	1.59	2.04	1.73	1.88	0.95	
Mar.	11	1.44	1.28	1.78	1.34	1.61	2.05	1.82	1.99	1.18	
Apr.	16	1.35	1.29	1.71	1.32	1.61	1.96	1.72	1.94	1.17	
Apr.	30	1.37	1.29	1.80	1.32	1.62	1.97	1.75	1.92	1.16	
May	13	1.39	1.30	1.78	1.30	1.14	1.99	1.75	1.90	1.13	
June	9	1.34	1.28	1.75	1.27	1.53	1.94	1.74	1.89	1.04	1.43
June	30	1.34	1.26	1.79	1.27	1.61	1.99	1.75	1.90	1.01	1.35
July	14	1.35	1.26	1.70	1.25	1.57	1.96	1.72	1.93	1.02	1.42
Aug.	2	1.35	1.23	1.74	1.27	1.60	1.96	1.72	1.87	1.01	1.42
Aug.	15	1.35	1.22	1.75	1.25	1.61	1.99	1.71	1.89	1.01	1.43
Aug.	29	1.37	1.22	1.74	1.28	1.62	1.97	1.72	1.92	1.01	1.44
Sept.	10	1.35	1.23	1.74	1.24	1.61	1.98	1.71	1.90	1.00	1.41
Oct.	21	1.40	1.25	1.82	1.31	1.64	2.03	1.77	1.95	1.01	1.47
Nov.	18	1.40	1.21	1.81	1.28	1.64	1.98	1.72	1.91	1.00	1.42
Dec.		1.35	1.22	1.78	1.26	1.63	1.98	1.78	1.87	0.98	1.42
											1.45

48" Depth  
1965 Data

June	1	1.71	1.62	1.75	1.26	1.96	2.20	1.81	2.05	0.90	
July	6	1.49	1.35	1.72	1.27	1.87	2.14	1.75	1.99	1.05	
Aug.	1	1.54	1.38	1.71	1.27	1.88	2.12	1.75	2.03	1.03	
Aug.	31	1.53	1.38	1.74	1.29	1.92	2.18	1.79	2.00	1.03	
Sept.	30	1.51	1.39	1.74	1.25	1.89	2.16	1.74	2.01	0.83	
Nov.	2	1.51	1.39	--	--	--	2.14	1.77	--	--	

48" Data Cont.

Feb.	12	1.51	1.38	1.72	1.31	1.83	2.14	1.75	2.03	0.83		
Mar.	11	1.61	1.43	1.79	1.31	1.92	2.21	1.78	2.08	1.12		
Apr.	16	1.50	1.39	1.74	1.29	1.86	2.14	1.72	2.01	1.07		
Apr.	30	1.52	1.41	1.74	1.27	1.87	2.16	1.78	1.99	1.04		
May	13	1.52	1.37	1.78	1.27	1.37	2.15	1.77	2.01	1.06		
June	9	1.51	1.37	1.77	1.27	1.86	2.14	1.76	2.04	1.05	1.43	1.56
June	30	1.51	1.36	1.73	1.29	1.86	2.13	1.73	2.01	1.04	1.42	1.57
July	14	1.48	1.36	1.71	1.25	1.82	2.12	1.74	1.99	1.01	1.42	1.55
Aug.	2	1.51	1.35	1.69	1.25	1.87	2.12	1.76	1.98	1.04	1.42	1.55
Aug.	15	1.54	1.35	1.71	1.24	1.80	2.11	1.75	1.97	1.04	1.42	1.54
Aug.	29	1.52	1.36	1.73	1.27	1.87	2.13	1.76	2.04	1.02	1.41	1.57
Sept.	10	1.52	1.38	1.71	1.24	1.91	2.11	1.75	2.04	1.02	1.41	1.52
Oct.	21	1.56	1.39	1.78	1.29	1.95	2.17	1.78	2.08	1.03	1.48	1.62
Nov.	18	1.55	1.38	1.74	1.28	1.89	2.15	1.79	1.98	1.01	1.45	1.61
Dec.		1.53	1.38	1.71	1.26	1.89	2.15	1.74	1.96	1.01	1.43	1.56

60" Depth  
1965 Data

June	1	1.88	1.66	1.76	1.22	2.12	2.08	1.81	2.02	1.16
July	6	1.64	1.42	1.71	1.28	2.06	2.01	1.81	2.09	1.36
Aug.	1	1.64	1.41	1.71	1.25	2.04	2.03	1.78	2.09	1.40
Aug.	31	1.68	1.41	1.77	1.26	2.13	2.10	1.82	2.13	1.32
Sept.	30	1.65	1.42	1.75	1.23	2.06	2.04	1.80	2.12	1.09
Nov.	2	1.67	1.40	--	--	--	2.07	1.81	--	--

1966 Data

Feb.	12	1.66	1.42	1.75	1.26	2.04	2.06	1.87	2.11	1.13		
Mar.	11	1.76	1.44	1.77	1.29	2.15	2.14	1.89	2.22	1.33		
Apr.	16	1.65	1.42	1.73	1.29	2.13	2.07	1.80	2.12	1.27		
Apr.	30	1.67	1.43	1.69	1.27	2.10	2.07	1.81	2.13	1.27		
May	13	1.66	1.43	1.73	1.23	1.47	2.10	1.82	2.10	1.26		
June	9	1.66	1.41	1.74	1.27	2.11	2.06	1.84	2.11	1.34	1.47	1.48
June	30	1.62	1.39	1.74	1.26	2.10	2.08	1.83	2.08	1.30	1.43	1.47
July	14	1.64	1.40	1.73	1.25	2.07	2.08	1.81	2.11	1.31	1.40	1.45
Aug.	2	1.65	1.41	1.71	1.23	2.10	2.07	1.82	2.11	1.33	1.43	1.41
Aug.	15	1.67	1.43	1.77	1.25	2.06	2.09	1.81	2.14	1.38	1.45	1.43
Aug.	29	1.63	1.39	1.73	1.23	2.08	2.05	1.79	2.11	1.35	1.43	1.45
Sept.	10	1.66	1.40	1.74	1.23	2.11	2.11	1.82	2.13	1.37	1.47	1.46
Oct.	21	1.77	1.48	1.78	1.29	2.19	2.16	1.89	2.19	1.36	1.53	1.52
Nov.	18	1.70	1.44	1.81	1.29	2.13	2.14	1.88	2.08	1.35	1.50	1.49
Dec.		1.67	1.42	1.74	1.25	2.10	2.08	1.85	2.08	1.35	1.46	1.44

Table 3. Summary of soil temperature recordings by area, plant community and depth for 1965 and 1966.



1966 Data

2-12-66	-2.4	-1.8	-3.2	-1.5	-3.0	-1.2	-4.0	-2.2	-4.0
3-11-66	2.0	0.0	3.0	3.0	3.0	2.0	3.0	2.8	0.0
4-16-66	10.5	10.4	10.2	9.4	10.8	7.0	8.0	8.0	9.0
4-30-66	8.0	8.0	6.5	6.0	7.0	7.0	7.0	8.0	7.0
5-13-66	13.2	13.2	13.2	13.2	13.2	10.2	12.0	12.0	13.3
6-9-66	17.4	16.3	17.4	17.9	17.3	14.6	15.6	15.4	16.1
6-30-66	22.0	21.0	21.8	22.2	22.0	18.8	19.9	19.9	21.0
7-14-66	24.2	22.5	23.5	24.4	24.4	20.4	21.4	21.9	23.9
8-3-66	26.0	24.8	24.9	25.8	25.6	22.8	23.2	24.0	25.2
8-15-66	24.0	23.2	23.5	24.2	23.2	21.2	22.2	22.1	24.0
8-29-66	22.4	21.8	22.2	23.2	22.6	20.8	21.6	21.8	23.1
9-10-66	22.4	22.0	21.8	21.1	21.8	19.8	21.2	21.2	22.2
10-21-66	9.2	10.0	9.0	8.2	8.8	10.5	10.6	10.0	9.6
11-18-66	7.0	5.2	5.0	5.6	5.8	6.2	5.8	5.2	3.8
12-17-66	-1.2	0.1	-0.2	-0.6	0.0	1.0	1.0	-1.6	-1.0

22" Depth  
1965 Data

5-21-65	14.0	14.5	14.5	14.5	14.5	16.0	13.5	12.5	18.5
6-1-65	15.0	15.5	15.0	16.0	16.0	13.5	13.5	14.0	15.5
7-6-65	20.0	20.5	19.5	20.0	20.0	18.0	18.5	18.0	21.0
8-1-65	23.0	22.5	22.5	22.5	23.0	21.0	21.0	21.0	23.5
8-31-65	20.0	20.0	20.0	20.0	19.0	19.0	19.5	19.5	20.0
9-30-65	10.0	10.0	10.0	11.0	10.0	11.0	11.5	12.0	9.0
11-2-65	10.0	10.0							

### 1966 Data

2-12-66	-2.4	-2.2	-3.0	1.0	-2.6	-1.8	-2.0	-1.5	-3.8
3-11-66	1.0	0.0	2.0	3.0	3.0	2.0	2.0	2.0	1.0
4-16-66	9.0	9.8	9.8	7.8	9.8	7.0	7.0	8.0	8.0
4-30-66	8.0	8.0	7.0	7.0	5.5	7.0	7.5	8.0	7.0
5-13-66	13.2	13.2	13.2	13.5	13.2	10.8	12.0	11.8	13.2
6-9-66	16.0	16.4	17.1	16.9	16.8	14.0	15.5	15.1	16.7
6-30-66	20.2	20.0	21.0	20.3	21.0	18.5	18.8	18.2	21.0
7-14-66	22.8	21.8	23.1	23.0	23.8	19.9	20.6	20.5	23.2
8-3-66	24.6	23.0	24.6	24.6	25.0	22.2	22.8	23.0	25.0
8-15-66	23.2	22.6	23.0	23.8	23.2	21.2	22.0	21.4	23.2
8-29-66	21.6	21.2	21.8	22.0	22.0	20.0	20.2	20.8	22.8
9-10-66	21.9	21.2	21.2	20.4	21.6	19.3	21.0	20.4	22.1
10-21-66	10.2	10.4	9.8	10.2	9.6	14.2	13.2	11.0	12.0
11-18-66	6.0	6.0	5.4	6.1	6.2	9.0	6.2	6.0	4.2
12-17-66	0.0	1.0	-0.1	1.0	-1.0	0.4	2.0	0.0	0.0

Table 4. Precipitation amounts measured at the soil moisture study areas.

<u>Date</u>	<u>AREAS</u>				
	<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>	<u>V</u>
11-2-65	Rain Gauges Established				
2-12-66	.45	.45	.40	.20	
3-11-66	.05	.05	.10	.10	
Late Winter Subtotals	.50	.50	.50	.30	
4-16-66	.61	.32	.91	.85	
4-30-66	.26	.25	.15	.10	
5-13-66	.00	.06	.00	.04	Estab.
6-9-66	.27	.19	.38	.36	.20
6-30-66	.40	.52	.30	.57	.28
7-14-66	.58	.06	.55	1.11	.40
Growing Season Subtotals	2.12	1.40	2.29	3.03	
8-2-66	.05	.11	.17	.17	.04
8-15-66	.04	.08	.10	.12	.23
8-29-66	.14	.07	.07	.07	.26
9-10-66	.02	.30	.14	.19	.09
10-21-66	.35	.36	.57	.26	.31
11-18-66	.07	.24	.14	.16	.05
12-29-66	.00	.00	.00	.00	.15
Late Summer and Fall Subtotals	.67	1.16	1.19	.97	1.13
1966 TOTAL	3.29	3.06	3.98	4.30	

Table 5. Range conditions and range sites, soil series and the associated plant species by study areas as classified by the Soil Conservation Service, September 9, 1966.

Location	Study Area	Plant Community	Soil Series	Range Site	Range Condition
Manderson	I	Nuttalls saltbush Big sagebrush	Chepeta Ocean Lake	Saline Upland Sandy	Excellent Excellent
East of Worland	II	Nuttalls saltbush Bud sagebrush Big sagebrush	Greybull Dry Creek Worland	Saline Upland Sandy Sandy	Excellent Good Fair
Steer Pastures	III	Nuttalls saltbush Brown sagebrush	Greybull (variant) Greybull	Shale Saline Upland	Excellent Good
Burnt Wagon	IV	Nuttalls saltbush Spiny hopsage	Greybull Ocean Lake	Saline Upland Sandy	Excellent High Good
Shell	V	Nuttalls saltbush Winterfat	Renner Renner (variant)	Saline Upland Silty	Excellent

Table 6. Stocking rates and class of livestock grazed on the different study areas.

<u>Location</u>	<u>Study Area</u>	<u>Class of Livestock and Season of Use</u>	<u>Approximate Stocking Rate</u>
Manderson	I	Sheep - Fall (end of September and all of October) Winter (January 15 to March 15) Cattle - Summer (April 15 to July 15) Fall (October 15 to November 15) Horses - in trespass	10 acres/AUM
East of Worland	II	Sheep - Winter (January 1 to February 20) Plus trailing, adjacent to the Sand Creek trail	9 acres/AUM
Steer Pastures	III	Sheep - Winter (October and November) Spring (some use) Cattle - Summer (used periodically) This is a common use area	13 acres/AUM
Burnt Wagon	IV	Cattle - Summer (July 1 for six weeks) Sheep - Winter (used if feed available)	13 acres/AUM
Shell	V	Sheep - Spring (April 9 to June 2) Winter (November 15 to February 22) Cattle - Spring (April 14 to June 20) Winter (October 16 to January 30) Horses - Winter (December 15 to April 15)	14.8 acres/AUM

S E C T I O N   I I I  
P R E C I P I T A T I O N   P A T T E R N   S T U D Y ,   1 9 6 6

I n t r o d u c t i o n

During 1960 over 70 gauges were installed at 6 to 12 mile intervals throughout the Big Horn and Wind River Basins. Since that time, some 30 rain gauges have been installed on various exclosures and study sites throughout the western half of Wyoming. These gauges are simple cans, 12" in height and approximately 2.75" in diameter. This diameter allows reading of precipitation by merely pouring the water into a 100 ml cylinder, and converting ml readings to inches of rainfall. One hundred ml is equal to 1" of precipitation. The gauges are read on the same four dates each year - April 15, July 1, September 1 and October 15. Personnel of the Worland, Lander, Rawlins, Casper, and Rock Springs Districts of the Bureau of Land Management cooperate with the University in reading the instruments. Some of the gauges are read by personnel of the Soil Conservation Service and the Wyoming Game and Fish Commission.

The weather bureau and the U. S. Geological Survey precipitation data are used to provide additional information from independent locations. This cooperative effort provides an effective network for future evaluation of precipitation patterns. A map of precipitation gauge locations was presented in the 1963 report.

1966 Results

Precipitation data for 1966 from the University gauges are presented in Table 1; those from the U. S. weather bureau stations are presented in Table 2. The rain gauges located for general pattern studies of precipitation within the Big Horn Basin were discontinued after the July 1, 1965, reading. The others located in the Wind River Basin are to be continued in conjunction with studies being conducted by the Bureau of Land Management and the U. S. Geological Survey in that area.

Moderate amounts of precipitation occurred during the winter period from October 15, 1965, to April 15, 1966. Precipitation during the remainder of the year was below normal at most sites, especially in the Big Horn Basin. For example, at the experimental pastures northwest of Greybull, a total amount of precipitation recorded for the year was 2.16". The very arid conditions associated with warm temperatures, especially during the summer, resulted in very limited plant growth. Annual weeds in many instances, were totally absent from many of the study areas, due solely to the lack of moisture for germination in the spring. On most areas grass production was severely decreased when compared to production of previous years. In the Wind River Basin, production values decreased also as a result of a decrease in precipitation values, but the reduction was not as extreme as that measured in the Big Horn Basin. On most other areas in the central and southwestern portions of the state, precipitation seemed to be near normal and growing conditions apparently were not as rigid as those occurring in the areas further north.

TABLE 1. Precipitation data for 1966 from University of Wyoming gauges for the periods - October 15-April 15 (Winter), April 15-July 1 (Spring), July 1-September 1 (Summer), and September 1-October 15 (Fall).

Rain Gauge Number	Rain Gauge Name	Winter	Spring	Summer	Fall	1966 Total	Long Term Average
1	Ant Hill Exc. - Worland	1.09	1.37	.37	.39	3.22	6.48
2	Farson Exc.	2.25	1.31	1.04	1.24	5.84	5.47
4	Dutch Nick Flats Exc.	1.23	1.56	1.00	.76	4.55	6.77
5	Ant Plot Exc. - Lander	1.75	2.83	2.10	2.21	8.89	7.51
6	Granite Mountain Exc.	1.32	2.43	2.28	2.04	8.07	8.08
7	Buffalo Creek Exc.	2.93	2.35	.65	.86	6.79	8.63
8	Demer Exc.	1.70	1.87	.58	.85	5.00	7.62
9	Upper Gov't Draw #1 Exc.	2.06	2.66	.82	2.74	8.28	7.79
10	Boysen Reservoir Exc.	.71	1.10	.55	.69	3.05	4.38
11	Sweetwater Exc.	.63	2.27	.93	1.62	5.45	6.32
12	Horse Creek Exc.	2.36	1.78	1.07	1.09	6.30	10.73
13	West Pasture Exc.	.88		.36	.31		6.54
14	McGraw Flat Exc.	2.70	2.48	1.19	1.60	7.97	8.95
15	15-Mile Study Pasture	1.41	.83	.89	.71	3.84	6.27
16	Lower Gov't Draw #2 Exc.	2.80	2.71	1.90	2.83	10.24	10.04
17	Burnt Wagon Exc.	1.15	1.07	1.47	.45	4.14	5.76
18	Cedar Mountain Exc.	2.21	1.73	1.20	1.49	6.63	8.53
19	Radio Tower Exc.	1.30	1.09	1.00	1.91	5.30	7.01
20	Black Mountain Exc.	2.88	1.62	.82	1.55	6.87	7.06
21	Kane Deer Exc.	2.30	1.47	1.38	1.32	6.47	9.44
22	LU Juniper Study	2.02	3.59	2.68	3.90	12.19	14.46
23	Sheep Springs Exc.	3.42	2.77	1.53	.96	8.73	13.29
24	Halogen Pasture	.35	.74	.45	.62	2.16	5.13
25	Red Wash #3 Exc.	1.85	2.37	1.95	1.60	7.77	8.92
26	Red Wash #1 Exc.	2.16	2.56	1.24	1.58	7.54	8.35
27	Little Robber #5 Exc.	2.54	2.20	1.18	.34	6.26	8.81
28	Red Wash #2 Exc.	2.04	1.51	1.10	1.70	6.35	7.13
30	Boars Tusk Exc.	2.54	2.10	1.32	2.50	8.46	7.60
31	Cumberland Exc. #1		1.34	.84	1.98		8.21
32	Cumberland Exc. #2	N.R.	6.03	.63	2.00	8.66	7.18
33	Cumberland Exc. #3	5.53	2.35	1.07	2.33	11.28	10.10
34	Cumberland Exc. #4	N.R.	6.08	.99	1.96	9.03	7.97
35	Elk Mountain Pit	3.93	1.62	.70	1.73	7.98	6.14
36	Smilo Exc.	2.08	1.74	.50	.96	5.28	7.93
39	Two-Mile Hill Exc.	2.60	1.63	2.30	1.12	7.65	10.36
41	Bud Kimball Exc.	1.96	1.59	1.00	.90	5.45	8.57
46	Gibbs Butte	1.22	1.94	1.01	1.87	6.04	6.73
47	Muskrat		1.52	1.27	1.91		6.64
48	Fuller Seed Plot	1.73	1.86	1.82	3.06	8.47	8.25
49	Canyon Creek	1.37	1.46	1.31	2.08	6.22	7.75
50	Muskrat #5 Exc.	1.22	2.10	1.16	2.45	6.93	8.08
51	Poison Creek	1.22	1.55	1.26	2.26	6.29	7.73
52	Alkali Flats	1.56	1.48	1.97	1.91	6.92	8.14
55	Fraser Seed Plot	.97	1.70	2.05	1.34	6.06	8.13
56	Logan #1 Exc.	1.51	1.55	2.47	2.69	8.22	8.09
57	Logan #2 Exc.	1.45	2.18	1.13	3.45	8.21	8.03
58	Empty Cartridge Exc.	1.72	2.86	1.74	2.70	9.02	7.63
59	Carter Divide Exc.	1.75	2.96	1.12	2.25	8.08	7.34

TABLE 1. Continued

Rain Gauge Number	Rain Gauge Name	Winter	Spring	Summer	Fall	1966 Total	Long Term Average
60	Dishpan Butte #1 Exc.	3.34	3.13	1.72			10.85
61	Dishpan Butte #2 Exc.	2.07	2.76	2.05	2.45	9.33	9.00
62	Hall Creek Divide Exc.	3.57	3.75	1.31	2.43	11.06	10.80
63	Little Popo-Agie	4.23	3.45	.91	2.80	11.39	11.04
64	Hudson	1.50	2.56	.94	2.33	7.33	8.33
65	Pan American	1.92	2.52	1.00	2.43	7.87	7.60
67	Madden	1.64	1.96	1.23	1.98	6.81	8.90
68	Johnston	1.84	1.75			1.89	6.80
75	Sand Gulch Exc.	1.90	1.99	.83	.42	5.14	8.91
76	Cochran Exc.	2.40	2.52	.85	.51	6.28	10.20
77	Kirby Creek Exc.	2.20	2.30	.70	.75	5.95	8.29
80	Poison Draw	1.12	1.55	.63	1.87	5.17	6.07
81	Mack Ranch	1.63	2.15	.90	.65	5.33	7.28
85	Bridger Creek	3.58	2.33	.83	.98	7.72	11.27
86	Dry Creek	1.19	1.49	.65	1.68	5.01	6.57
87	Hoodoo Creek	.78	.90	.69	1.92	4.29	5.54
88	Comet Mine	2.92	2.89	1.23	1.83	8.87	12.02
89	Birdseye Ranch	1.91				1.00	8.32
95	Farson Guzzler #1	2.71	1.09	.50	2.04	6.34	8.06
96	Farson Guzzler #2	2.41	1.58	.94	2.25	7.18	9.06
97	Farson Guzzler #3	2.47	1.48	.74	1.66	6.35	7.16
98	Farson Guzzler #4	2.61	2.12	.66	1.65	7.04	7.72
99	Farson Guzzler #5	2.47	1.90	.63	1.20	6.20	6.96
100	Buffalo Basin Exc.				1.66	2.54	
101	Ten Mile Ridge	1.75	1.41	.78	1.53	5.47	
102	Chandler-Simpson Well	.77	.92			1.28	
103	Daley Hay Corral			1.60	1.22	2.26	
104	J. O. Headquarters	1.51	1.42	.73	1.69	5.35	
105	Len Hay Corral	1.53	1.44	1.55	2.08	6.60	
106	Stinking Creek			1.65	1.92	.85	
107	Owl Draw			1.31	1.79	1.25	
108	Mud Springs			1.66			
109	Bolton Creek Exc.				1.61	1.84	1.70
110	Elk Exc.						

N.R. = Not Read

TABLE 2. Precipitation data from the U. S. Weather Bureau Stations for the period October 15, 1965, to October 15, 1966.<sup>1</sup>

Station Name	WINTER	SPRING	SUMMER	FALL	1966	Long Term Average <sup>3</sup>
	Oct. 15 to Apr. 15	Apr. 15 to July 1	July 1 to Sept. 1	Sept. 1 to Oct. 15		
<b>BIG HORN BASIN</b>						
Anchor Dam	2.19	3.25	2.08	2.97	10.49	
Basin	1.68	1.02	.63	1.13	4.46	6.21
Black Mountain	3.59	2.91	.38	2.32	9.20	
Cody 12 SE	2.07	1.99	1.70	2.59	8.35	
Deaver	.91	1.62	.79	1.09	4.41	5.21
Emblem	.97	1.52	.72	2.24	5.45	
Grass Creek	.78	2.36	2.10	2.45	7.69	
Greybull 1S	1.17	.85	.65	.71	3.38	
Heart Mountain	1.16	1.74	1.49	1.05	5.44	
Lovell	.87	1.00	.61	.48	2.96	6.92
Powell	.32	1.54	1.28	.90	4.04	5.67
Reirden 2 WSW	1.48	1.24	.35	.48	3.55	
Shell	2.19	1.55	1.03	.84	5.61	
Tensleep 4 NE	2.24	2.32	1.39	2.40	8.35	
Tensleep 16 SSE	3.06	2.55	1.09	1.65	8.35	
Thermopolis 2	2.13	2.35	.99	1.41	6.88	
Thermopolis 25 WNW	1.54	2.25	1.69	1.78	7.26	
Worland	1.07	.80	.37	.35	2.59	7.76
Worland FAA AP	1.74	1.04	.82	.31	3.91	
<b>WIND RIVER BASIN</b>						
Arminio	1.23	2.28	1.41	2.68	7.60	
Boysen Dam	1.15	2.04	.83	1.83	5.85	
Diversion Dam	1.00	2.78	1.05	2.63	7.46	9.45
Fort Washakie 2 S	2.50	3.68	1.37	4.01	11.56	11.90
Gas Hills 4 E	.95	1.12	.70	1.27	4.04	
Landier WB AP	3.19	3.80	2.05	2.71	11.75	13.58
Lost Cabin	1.30	2.23	1.21	3.02	7.76	
Morton 1 NW	1.51	2.26	1.73	2.59	8.09	
Pavillion	1.33	2.25	2.84	1.98	8.40	8.67
Riverton	1.15	1.34	1.38	1.85	5.62	8.79
Sand Draw	1.96	2.83	2.47	3.18	10.44	
Shoshoni	1.01	1.63	1.00	1.53	5.17	
<b>SOUTHWEST WYOMING</b>						
Farson	2.10	1.78	1.02	2.16	7.06	
Kemmerer	3.25	1.66	.45	2.46	7.82	
Rock Springs	1.94	1.59	2.33	2.17	8.03	
Rock Springs FAA AP	2.96	1.78	1.42	1.90	8.06	
Wamsutter 1 N	1.24	1.58	.86	1.53	5.21	
Muddy Gap	2.23	2.42	2.19	2.11	8.95	
Rawlins FAA AP	2.50	1.85	.99	1.45	6.79	

<sup>1</sup>Weather Bureau. 1965-1966. Climatological Data - Wyoming. U. S. Dept. Commerce. Vols. 74 & 75.

<sup>2</sup>Computed for the period October 15, 1965, to October 15, 1966.

<sup>3</sup>Weather Bureau. 1965. Climatological Data - Wyoming Annual Summary. U. S. Dept. Commerce. Vol. 74, No. 13.

S E C T I O N      I V

EXCLOSURE STUDIES (PRODUCTION, COVER, HEIGHT AND PRECIPITATION PHASE)  
1966

Vegetation production studies on exclosures and relic areas of the Big Horn and Wind River Basins were initiated during the 1962 field season. Most of the exclosures were constructed in 1959 and 1960. The objectives of the program were to determine:

1. the relationship of annual herbage production to area cover percentage;
2. the relationship of annual herbage production changes to variations in time and amount of available moisture;
3. the relationship of plant height of major forage species to annual herbage production and to time and amount of available moisture;
4. the influence of several range improvement practices on herbage production, area cover, and plant height;
5. the relationship of percentage frequency to area cover and herbage production.

Methods and Procedures

Area cover and herbage production studies on sagebrush-grass sites were conducted on transects of 20 quadrats, 1' x 1', spaced systematically along a randomly located 100' steel tape. On sites dominated by saltsage, data were obtained in like manner except that plot size was 1' x 10'. The plot frame was placed at right angles to the steel tape and vegetation data were subdivided into ten subplots.

Area cover of herbaceous and low growing semi-woody species was estimated within each square foot plot. Shrub crown cover, including that of pricklypear cactus and phlox, was estimated within the square foot plots, but these data were not combined when comparing area cover to forage production.

Forage production was determined by clipping herbaceous species at ground or crown level. Exclosures were clipped on or near the same date as the previous years. Clippings were oven-dried at 70°C for 24 hours prior to weighing.

Precipitation data were recorded from simple aluminum rain gauges installed at each enclosure. Precipitation data were recorded four times a year - April 15, July 1, September 1, and October 15.

Metal stakes were driven into the ground for permanent photo location points in the area where production studies are being conducted in each exclosure.

Names of plants which occurred in the production study areas are shown in Table 1. Included are the four letter code names by which the plants are identified in the tabular material; genus, species, and common names, and life form and characteristic longevity of the plants.

1966 Results

A list, by counties, of production study areas is presented in Table II of the report. General locations of exclosures were shown on maps in the 1964 report. The tabular data of production, cover, frequency, and precipitation are arranged alphabetically by exclosure or study area name following Table II.

Production clipping in 1966 was conducted both inside and outside the exclosures and study areas to determine the influence of grazing upon the vegetation during the five previous years. In some instances significant variations in production were noted outside the exclosures as compared to inside. Some areas however, showed very little difference. At the exclosures where sagebrush had been controlled, response of understory vegetation to the procedure was easily visible both inside and outside. Production values were lower in the grazed areas but was greater on the sprayed sites than on the non-sprayed. Both Upper and Lower Government Draw study areas showed very heavy use outside the enclosure on the clipping dates.

The influence of the dry spring and summer of 1966, which retarded plant growth, was evident in the production values of many areas. The dry conditions caused a great reduction in annual forb production in the Big Horn Basin while grasses were only slightly reduced in the Wind River Basin.

TABLE I. LIST OF PLANT NAMES WHICH OCCURRED IN PRODUCTION STUDY AREAS

Code	Genus - Species	Common	Life Form	Longevity
AGR	<i>Agropyron</i> spp.	Wheatgrasses	Grass	Perennial
AGSM	<i>Agropyron smithii</i>	Western wheatgrass	Grass	Perennial
ALTE	<i>Allium textile</i>	Textile onion	Forb	Perennial
ARA	<i>Arabis</i> spp.	Rockcresses	Forb	Perennial
ARCA	<i>Artemesia cana</i>	Silver sagebrush	Shrub	Perennial
ARNO	<i>Artemesia nova</i>	Black sagebrush	Shrub	Perennial
ARPE	<i>Artemesia pedatifida</i>	Brown sagebrush	Half-shrub	Perennial
ARSP	<i>Artemesia spinescens</i>	Bud sagebrush	Half-shrub	Perennial
ART	<i>Artemesia</i> spp.	Sagebrushes	Shrub	Perennial
ARTR	<i>Artemesia tridentata</i>	Big sagebrush	Shrub	Perennial
AST	<i>Astragalus</i> spp.	Milkvetches	Forb	
ATNU	<i>Atriplex nuttallii</i>	Nuttall saltbush	Half-shrub	Perennial
BOGR	<i>Bouteloua gracilis</i>	Blue grama	Grass	Perennial
BRJA	<i>Bromus japonicus</i>	Japanese chess	Grass	Annual
BRTE	<i>Bromus tectorum</i>	Cheatgrass brome	Grass	Annual
CAFI	<i>Carex filifolia</i>	Threadleaf sedge	Sedge	Perennial
CAMI	<i>Camelina microcarpa</i>	Littlepod falseflax	Forb	Annual
CEAR	<i>Cerastium arvense</i>	Field chickweed	Forb	Perennial
CHVI	<i>Chrysanthemum viscidiflorus</i>	Green rabbitbrush	Shrub	Perennial
CRAC	<i>Crepis acuminatus</i>	Tapertip hawksbeard	Forb	Perennial
CRE	<i>Crepis</i> spp.	Hawksbeard	Forb	Perennial
DEPI	<i>Descurainia pinnata</i>	Pinnate tansymustard	Forb	Annual
ERI	<i>Erigeron</i> spp.	Fleabanes	Forb	Perennial
ERPU	<i>Erigeron pumilus</i>	Fleabane	Forb	Perennial
EULA	<i>Eurotia lanata</i>	Winterfat	Half-shrub	Perennial
FEOC	<i>Festuca octoflora</i>	Sixweeks fescue	Grass	Annual
GUSA	<i>Gutierrezia sarothrae</i>	Broom snakeweed	Half-shrub	Perennial
HAGL	<i>Halogenetum glomeratus</i>	Halogenetum	Forb	Annual
HYAC	<i>Hymenoxys acaulis</i>	Stemless hymenoxys	Forb	Perennial
KOCR	<i>Koeleria cristata</i>	Junegrass	Grass	Perennial
LARE	<i>Lappula redowskii</i>	Stickseed	Forb	Annual
LATE	<i>Lappula texana</i>	Stickseed	Forb	Annual
LEDE	<i>Lepidium densiflorum</i>	Prairie pepperweed	Forb	Annual
LEPU	<i>Leptodactylon pungens</i>	Granite gilia	Forb	Perennial
LES	<i>Lesquerella</i> spp.	Bladderpods	Forb	Perennial
LOM	<i>Lomatium</i> spp.	Lomatium	Forb	Perennial
LYJU	<i>Lygodesmia juncea</i>	Rush skeletonweed	Forb	Perennial
MAGL	<i>Machaeranthera glabriuscula</i>	Woody aster	Half-shrub	Perennial
MATA	<i>Machaeranthera tanacetifolia</i>	Tansyleaf aster	Forb	Annual
MUDI	<i>Musineon divaricatum</i>	Falsecarrot	Forb	Perennial
MUSO	<i>Munroa squarrosa</i>	False buffalograss	Grass	Annual
OECA	<i>Oenothera caespitosa</i>	Evening primrose	Forb	
OPPO	<i>Opuntia polyacantha</i>	Plains pricklypear	Forb	Perennial
ORHY	<i>Oryzopsis hymenoides</i>	Indian ricegrass	Grass	Perennial
PEN	<i>Penstemon</i> spp.	Penstemons	Forb	Perennial
PHHO	<i>Phlox hoodii</i>	Hood's phlox	Forb	Perennial
PLPA	<i>Plantago patagonica</i>	Wooly indianwheat	Forb	Annual
POA	<i>Poa</i> spp.	Bluegrasses	Grass	Perennial

(continued)

TABLE I. Continued

POFE	Poa fendleriana	Mutongrass	Grass	Perennial
POSE	Poa secunda	Sandberg bluegrass	Grass	Perennial
SAKA	Salsola kali	Russian thistle	Forb	Annual
SAVE	Sarcobatus vermiculatus	Greasewood	Shrub	Perennial
SIHY	Sitanion hystrix	Squirreltail bottlebrush	Grass	Perennial
SPCO	Sphaeralcea coccinea	Scarlet globemallow	Forb	Perennial
SPCR	Sporobolus cryptandrus	Sand dropseed	Grass	Perennial
STCO	Stipa comata	Needleandthread	Grass	Perennial
STI	Stipa spp.	Needlegrass	Grass	Perennial
TRI	Trifolium spp.	Clovers	Forb	
UNK	Unknown forbs		Forb	
VER	Veronica spp.	Speedwell	Forb	Perennial
VIAM	Vicia americana	American vetch	Forb	Perennial

TABLE II. AN ALPHABETICAL LISTING OF STUDY AREA, THE COUNTY WHERE EACH OCCURS AND THE TREATMENTS STUDIED IN EACH AREA.

County Name Code	Exclosure Name	County	Treatment
1001	Ant Erad. Lander Ex.	Fremont	Inside Native Outside Native
1002	Boysen Reservoir Ex.	Fremont	Inside Native Outside Native
1003	Lower Gov't Draw Ex.	Fremont	Inside Native Inside Spray Outside Native Outside Spray
1004	McGraw Flat Ex.	Fremont	Inside Native Outside Native
1005	Sweetwater Ex.	Fremont	Inside Native Outside Native
1006	Upper Gov't Draw Ex.	Fremont	Inside Native Inside Spray Outside Native Outside Spray
1007	Granite Mountain Ex.	Fremont	Inside Native Inside Spray Outside Native Outside Spray
2002	Buffalo Creek Ex.	Washakie	Inside Native Outside Native
2003	Burnt Wagon Ex.	Washakie	Inside Native Outside Native
2004	Demer Ex.	Washakie	Inside Native Outside Native
2005	Dutch Nick Flat Ex.	Washakie	Inside Native Outside Native
2006	West Pasture Ex.	Washakie	Inside Native Outside Native
2007	Bud Kimball Ex.	Washakie	Inside Native Inside Spray Outside Native Outside Spray
2009	Smilo Ex.	Washakie	Inside Native Inside Spray Outside Native Outside Spray
2010	Two Mile Hill Ex.	Washakie	Inside Native Outside Native
1501	Cochran Ex.	Hot Springs	Inside Native Inside Spray Inside Pitted Inside Cultivated Outside Native Outside Spray

(continued)

TABLE II. Continued

1502	Kirby Creek Ex.	Hot Springs	Inside Outside	Native Native
1503	North Butte Relic Area (Thermopolis)	Hot Springs		
1504	Round Top Relic Area	Hot Springs		
1505	Sand Gulch Ex.	Hot Springs	Inside Outside	Native Native
0901	Halogeton Pasture #1	Big Horn	Inside	Native
0902	Halogeton Pasture #2	Big Horn	Inside	Native
0903	Halogeton Pasture #3	Big Horn	Inside	Native
0904	Halogeton Pasture #1	Big Horn	Outside	Native
0905	Halogeton Pasture #2	Big Horn		
0907	Halogeton Pasture #4a	Big Horn		
0908	Halogeton Pasture #4b	Big Horn		
0909	Halogeton Pasture #5	Big Horn		
0910	Halogeton Pasture #6	Big Horn		
0911	Halogeton Pasture #7a	Big Horn		
0912	Halogeton Pasture #7b	Big Horn		
0913	Horse Creek Ex.	Big Horn	Inside Inside Outside Outside	AGSM AGSP AGSM AGSP
0404	Farson Ex.	Sweetwater	Inside Outside	Native Native
1901	Cumberland Ex. #1	Uinta	Inside Inside Outside	Native Spray Native
1902	Cumberland Ex. #4	Uinta	Inside Outside	Native Native
1201	Cumberland Ex. #2	Lincoln	Inside Inside Outside	Native Spray Native
1202	Cumberland Ex. #3	Lincoln	Inside Inside Outside	Native Spray Native
			Outside	Spray

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Ant Eradication Lander Inside Native 8/23/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occurrences F $\div$ E	Wgt./ Unit Basal Area F $\div$ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
*ARTR	181.00	9.05			14				
AGSM	13.00	.65	31.10		18	15.62	.87	1.20	74.98
POSE	8.50	.43	20.57		8	4.30	.54	.51	20.63
ORHY	1.00	.05	2.39		1		.62	.62	2.98
STCO	11.50	.58	27.75		7	9.81	1.40	.85	47.09
BOGR	7.00	.35	16.75		1	1.79	1.79	.26	8.59
ANNUAL FORBS		.50							
DEPI		.50	.03	1.44		1			
PERENNIAL FORBS									
*OPPO	108.00	5.40				5			
*PHHO	2.00	.10				1			
TOTAL		2.09	100.00				32.14		154.27
<i>*Not computed in percent composition</i>									

Precipitation Data:

R. G. #5 - Ant Eradication Exc. Riverton	
October 15 to April 15	= 1.75
April 15 to July 1	= 2.83
July 1 to September 1	= 2.10
September 1 to October 15	= 2.21
Season Total	= 8.89
Long Term Average	= 8.09

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Anthill Lander Outside Native 8/23/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F $\div$ E	Wgt./ Unit Basal Area F $\div$ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
*ARTR	127.50	6.38			13				
AGSM	13.00	.65	9.49		20	11.55	.58	.89	55.44
STCO	7.00	.35	5.11		3	5.15	1.72	.74	24.72
POSE	17.00	.85	12.41		13	5.03	.39	.30	24.14
BOGR	99.00	4.95	72.26		6	5.62	.94	.06	26.98
ANNUAL FORBS	1.00								
PLPA	1.00	.05	.73		2	.40	.20	.40	1.92
PERENNIAL FORBS									
*OPPO	125.00	6.25			2				
*SPCO	1.50	.08			3				
*PHHO	1.00	.05			1				
TOTAL		6.85	100.00			27.75			133.20

\*Not computed in percent composition

Precipitation Data:

R. G. #5 - Ant Eradication Exc. Riverton	
October 15 to April 15	= 1.75
April 15 to July 1	= 2.83
July 1 to September 1	= 2.10
September 1 to October 15	= 2.21
Season Total	= 8.89
Long Term Average	= 8.09

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Boysen Exc. Inside Native 8/1/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occurrences $F \frac{f}{e} E$	Wgt./ Unit Basal Area $F \frac{f}{e} A$	Pounds Per Acre $F \times 4.8$
	A	B	C		E	F	G	H	I
BOGR SPCR	123.00 .50	6.15 .03	99.51 .49		14 1	18.67 .16	1.33 .16	.15 .32	89.63 .77
PERENNIAL FORBS *SPCO *OPPO	4.00 38.00	.20 1.90			8 3				
TOTAL		6.18	100.00			18.83			90.39
*Not computed in percent composition									

Precipitation Data:

R. G. #10 - Boysen Res.	
October 15 to April 15	= .71
April 15 to July 1	= 1.10
July 1 to September 1	= .55
September 1 to October 15	= .69
Season Total	= 3.05
Long Term Average	= 4.38

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Boysen Exc. Outside Native 8/1/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occurrences F ÷ E	Wgt./ Unit Basal Area F ÷ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
BOGR	45.50	2.28	91.94		12	6.14	.50	.13	29.47
ANNUAL FORBS	4.00								
HAGL	4.00	.20	8.06		7	7.29	1.04	1.82	34.99
PERENNIAL FORBS									
*SPCO	2.00	.10			4				
*OPPO	60.00	3.00			1				
TOTAL		2.48	100.00			13.43			64.46

\*Not computed in percent composition

Precipitation Data:

R. G. #10 - Boysen Res.	
October 15 to April 15	= .71
April 15 to July 1	= 1.10
July 1 to September 1	= .55
September 1 to October 15	= .69
Season Total	= 3.05
Long Term Average	= 4.38

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Bud Kimball Inside Non-Sprayed 7/20/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F $\frac{1}{2}$ E	Wgt./ Unit Basal Area F $\frac{1}{2}$ A	Pounds Per Acre F x 4.8
*ARTR	187	9.35			11				
AGSM	9.5	.48			15	7.47	.50	.79	35.86
POSE	68.5	3.43	12.28 87.72		18	13.70	.76	.20	65.76
PERENNIAL FORBS									
*PHHO	2	.10			1				
*OPPO	76	3.80			4				
TOTAL		3.91	100.00			21.17			101.62

\*Not computed in percent composition

Precipitation Data:

R. G. #41 - Bud Kimball Exc.	
October 15 to April 15	= 1.96
April 15 to July 1	= 1.59
July 1 to September 1	= 1.00
September 1 to October 15	= .90
Season total	= 5.45
Long Term Average	= 8.67

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Bud Kimball Outside Non-Sprayed 7/20/66	Total Trans. Basal Area Percent	Average Basal Area	Percent Basal Area		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occurrences $F \frac{?}{?} E$	Wgt./ Unit Basal Area $F \frac{?}{?} A$	Pounds Per Acre $F \times 4.8$
	A	B	C		E	F	G	H	I
*ARTR	52.0	2.60			7				
AGSM	10.0	.50	16.45		17	8.85	.52	.89	42.48
POSE	46.0	2.30	75.65		19	9.44	.50	.21	45.31
SITHY	2.5	.13	4.28		2	2.28	1.14	.91	10.94
FEOC	1.0	.05	1.64		2	.02	.01	.02	.10
ANNUAL FORBS	1.0				2	.04	.02	.02	.19
LATE	.5	.03	.99		1				
PLPA	.5	.03	.99		1				
PERENNIAL FORBS									
*PHHO	8.5	.43			5				
TOTAL		3.04	100.00			20.63			99.02

\*Not computed in percent composition

Precipitation Data:

R. G. #41 - Bud Kimball Exc.	
October 15 to April 15	= 1.96
April 15 to July 1	= 1.59
July 1 to September 1	= 1.00
September 1 to October 15	= .90
Season Total	= 5.45
Long Term Average	= 8.67

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

Cover Determined by Area Estimate

No. Plots 20

Bud Kimball Inside Sprayed 7/20/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occurrences $F \div E$	Wgt./ Unit Basal Area $F \div A$	Pounds Per Acre $F \times 4.8$
	A	B	C		E	F	G	H	I
*ARTR	22	1.10			3				
POSE	84.5	4.23	84.94		20	17.29	.86	.20	82.99
AGSM	14	.70	14.06		18	22.15	1.23	1.58	106.32
SIHY	1	.05	1.00		1	.17	.17	.17	.82
PERENNIAL FORBS									
*OPPO	9	.45			3				
*PHHO	.5	.03			1				
TOTAL		4.98	100.00			39.61			190.13

\*Not computed in percent composition

Precipitation Data:

R. G. #41 - Bud Kimball Exc.	
October 15 to April 15	= 1.96
April 15 to July 1	= 1.59
July 1 to September 1	= 1.00
September 1 to October 15	= .90
Season Total	= 5.45
Long Term Average	= 8.67

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Bud Kimball Outside Sprayed 7/20/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F $\frac{c}{r}$ E	Wgt./ Unit Basal Area F $\frac{c}{r}$ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
AGSM	13.5	.68	20.36		18	13.61	.76	1.01	65.33
POSE	43.5	2.18	65.27		20	11.89	.59	.27	57.07
FEOC	3.0	.15	4.48		6	1.00	.17	.33	4.80
ANNUAL FORBS	6.5				11				
POPA	5.0	.25	7.49		9				
LATE	1.5	.08	2.40		3				
PERENNIAL FORBS									
*OPPO	21	1.05			3				
TOTAL		3.34	100.00			27.92			134.02

\*Not computed in percent composition

Precipitation Data:

R. G. #41 - Bud Kimball Exc.	
October 15 to April 15	= 1.96
April 15 to July 1	= 1.59
July 1 to September 1	= 1.00
September 1 to October 15	= .90
Season Total	= 5.45
Long Term Average	= 8.67

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Buffalo Creek Inside Native 7/28/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F ÷ E	Wgt./ Unit Basal Area F ÷ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
*ARTR	162.00	8.10			6				
AGSM	7.00	.35	4.30		10	5.89	.59	.84	28.27
AGSP	72.00	3.60	44.23		8	53.64	6.71	.75	257.47
POSE	13.50	1.58	19.41		17	13.38	.79	.42	64.22
BOGR	44.00	2.20	27.03		4	3.76	.94	.09	18.05
BRTE	2.50	.13	1.60		5	.86	.17	.34	4.13
ANNUAL FORBS	5.50								
PLPA	4.00	.20	2.46		11	1.33	.12	.24	6.38
LEDE	1.50	.08	.97		8				
					3				
PERENNIAL FORBS									
*OPPO	15.00	.75			2				
*PHHO	16.00	.80			8				
*SPCO	.50	.03			1				
*CEAR	.50	.03			1				
TOTAL		8.14	100.00			78.86			378.52
*Not computed in percent composition									

Precipitation Data:

R. G. #7 - Buffalo Creek Exc.	
October 15 to April 15	= 2.93
April 15 to July 1	= 2.35
July 1 to September 1	= .65
September 1 to October 15	= .86
Season Total	= 6.79
Long Term Average	= 9.60

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

	Total Trans. Basal Area 7/28/66	Average Percent Basal Area	Percent Compo- sition	Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F ÷ E	Wgt./ Unit Basal Area F ÷ A	Pounds Per Acre F x 4.8
	A	B	C	E	F	G	H	I
*ARTR	20.00	1.00		8				
POSE	34.50	1.75	39.95	19	13.50	.71	.39	64.80
AGSM	10.50	.53	12.10	15	14.90	.99	1.42	71.52
BRTE	12.00	.60	13.70	15	4.55	.30	1.25	21.84
AGSP	4.00	.20	4.57	2	2.74	1.37	.68	13.15
BOGR	14.00	.70	15.98	4	4.05	1.01	.29	19.44
ANNUAL FORBS	12.00			20	8.94	.48		
PLPA	12.00	.60	13.70	20			.75	42.91
PERENNIAL FORBS								
*SPCO	.50	.03		1				
*OPPO	70.00	3.50		2				
*PHHO	1.00	.05		1				
TOTAL		4.38	100.00		48.68			233.66
*Not computed in percent composition								

Precipitation Data:

R. G. #7 - Buffalo Creek Exc.	
October 15 to April 15	= 2.93
April 15 to July 1	= 2.35
July 1 to September 1	= .65
September 1 to October 15	= .86
Season Total	= 6.79
Long Term Average	= 9.60

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 10

No. Plots 20

Cover Determined by Area Estimate

Burnt Wagon Inside Native 7/5/66	Total Trans., Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency %Base 200	Total Weight Gms/200 /sq.ft.	Average Weight Per Plot Occur- rences F ÷ E	Wgt./ Unit Basal Area F ÷ A	Pounds Per Acre F x .48
	A	B	C		E	F	G	H	I
ATNU SIHY	1329.5 11.5	6.65 .06	98.52 .89		75 8	233.25 3.05	3.11 .38	.18 .27	111.96 1.47
PERENNIAL FORBS ALTE MUDI	7.0 .5 6.5	.01 .03	.15 .44		9 1 9	1.53	.17	.22	.73
TOTAL		6.75	100.00			237.83			114.16

Precipitation Data:

R. G. #17 - Burnt Wagon Exc.

October 15 to April 15	= 1.15
April 15 to July 1	= 1.07
July 1 to September 1	= 1.47
September 1 to October 15	= .45
Season Total	= 4.14
Long Term Average	= 5.76

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 10

No. Plots 20

Cover Determined by Area Estimate

Burnt Wagon Outside Native 7/7/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency %Base 200	Total Weight Gms/200 /sq.ft.	Average Weight Per Plot Occurrences F ÷ E	Wgt./ Unit Basal Area F ÷ A	Pounds Per Acre F x .48
	A	B	C		E	F	G	H	I
ATNU SIHY	144.2 3	7.21 .02	94.50 .26		79 3	301.83 1.32	3.82 .44	.21 .44	144.88 .63
PERENNIAL FORBS MUDI ALTE	80.5 7.6 4.5	.38 .02	4.98 .26		98 93 8	8.94	.09	.11	4.29
TOTAL		7.63	100.00			312.09			149.80

Precipitation Data:

R. G. #17 - Burnt Wagon Exc.	
October 15 to April 15	= 1.15
April 15 to July 1	= 1.07
July 1 to September 1	= 1.47
September 1 to October 15	= .45
Season Total	= 4.14
Long Term Average	= 5.76

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Cochran Inside Native Non-spray	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occurrences F $\frac{1}{2}$ E	Wgt./ Unit Basal Area F $\frac{1}{2}$ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
*ARTR	261.00	13.05			14				
POSE	32.00	1.60	60.61		17	16.44	.97	.51	78.91
BRTE	2.00	.10	3.79		4	.73	.18	.37	3.50
AGSM	14.00	.70	26.52		19	20.94	1.10	1.49	100.51
FEOC	1.00	.05	1.89		2	.17	.08	.17	.82
ANNUAL FORBS	4.00				7	.28	.04	.07	1.34
PLPA	1.00	.05	1.89		2				
DEPI	1.50	.07	2.65		3				
LEDE	1.50	.07	2.65		3				
PERENNIAL FORBS									
*OPPO	40.00	2.00			2				
*LEPU	.5	.02			1				
TOTAL		2.64	100.00			38.56			185.08
*Not computed in percent composition									

Precipitation Data:

R. G. #76 - Cochran Exclosure

October 15 to April 15	= 2.40
April 15 to July 1	= 2.52
July 1 to September 1	= .85
September 1 to October 15	= .51
Season Total	= 6.28
Long Term Average	= 10.20

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Cochran Exc. Outside Native 7/28/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F ÷ E	Wgt./ Unit Basal Area F ÷ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
*ARTR	140.50	7.03			13				
POSE	24.00	1.20	34.09		19	22.03	1.16	.92	105.74
AGSM	12.00	.60	17.04		19	26.32	1.32	2.19	126.34
FEOC	7.50	.38	10.80		15	10.46	.70	1.39	50.21
BRTE	4.50	.23	6.55		9	6.43	.71	1.43	30.86
STCO	3.00	.15	4.26		1	3.55	3.55	1.18	17.04
ANNUAL FORBS	10.00								
PLPA	8.00	.40	11.36		17	12.73	.75	1.27	61.10
LEDE	.5	.03	.85		1				
DEPI	1.00	.50	14.20		2				
LATE	.5	.03	.85		1				
PERENNIAL FORBS									
*SPCO	.5	.03			1				
*ERIGERON	.5	.03			1				
*LEPU	.5	.03							
TOTAL		3.52	100.00			81.52			391.29
*Not computed in percent composition									

Precipitation Data:

R. G. #76 - Cochran Exclosure	
October 15 to April 15	= 2.40
April 15 to July 1	= 2.52
July 1 to September 1	= .85
September 1 to October 15	= .51
Season Total	= 6.28
Long Term Average	= 10.20

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Cochran Exc. Inside Sprayed 7/28/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occurrences $F \div E$	Wgt./ Unit Basal Area $F \div A$	Pounds Per Acre $F \times 4.8$
	A	B	C		E	F	G	H	I
*ARTR	66.00	3.30			5				
POSE	14.00	.70	31.67		17	5.96	.35	.42	28.61
AGSM	16.00	.80	36.20		20	25.90	1.29	1.62	124.32
BRTE	5.00	.25	11.31		9	1.09	.12	.22	5.23
FEOC	2.00	.10	4.52		4	1.13	.28	.56	5.42
ANNUAL FORBS	7.00				12				
PLPA	6.00	.30	13.58		11				
LATE	.50	.03	1.36		1				
DEPI	.50	.03	1.36		1				
PERENNIAL FORBS									
*OPPO	13.00	.65			2				
*LEPU	.50	.03			1				
TOTAL		2.21	100.00			35.89			172.27
*Not computed in percent composition									

Precipitation Data:

R. G. #76 - Cochran Exclosure	
October 15 to April 15	= 2.40
April 15 to July 1	= 2.52
July 1 to September 1	= .85
September 1 to October 15	= .51
Season Total	= 6.28
Long Term Average	= 10.20

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Cochran Exc. Outside Spray 7/28/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occurrences F ÷ E	Wgt./ Unit Basal Area F ÷ A	Pounds Per Acre F x 4.8
		A	B	C	E	F	G	H	I
#ARTR	11.00	.55			2				
POSE	6.5	.33	17.10		12	3.70	.31	.60	17.76
AGSM	8.5	.43	22.30		15	8.78	.59	1.03	42.14
BRTE	13.50	.68	35.23		20	17.27	.86	1.28	82.89
FEOC	2.5	.13	6.73		5	.89	.18	.36	4.29
AGSP	1.00	.05	2.59		2	3.42	1.71	1.71	16.41
BOGR	.5	.03	1.55		1	.50	.50	1.00	2.40
ANNUAL									
FORBS	5.50								
PLPA	5.50	.28	14.50		10	3.43	.34	.62	16.46
TOTAL		1.93	100.00			37.99			182.35
*Not computed in percent composition									

Precipitation Data:

R. G. #76 - Cochran Exclosure	
October 15 to April 15	= 2.40
April 15 to July 1	= 2.52
July 1 to September 1	= .85
September 1 to October 15	= .51
Season Total	= 6.28
Long Term Average	= 10.20

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

Cover Determined by Area Estimate

No. Plots 20

Cochran Inside Cultivated Native 7/28/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occurrences F $\frac{1}{\pi}$ E	Wgt./ Unit Basal Area F $\frac{1}{\pi}$ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
•ARTR	90.0	4.5			10				
POSE	21.0	1.05	28.85		17	12.67	.75	.60	60.82
AGSM	10.0	.5	13.73		15	13.54	.90	1.35	64.99
FEOC	3.5	.18	4.95		7	1.45	.21	.41	6.96
BRTE	29	1.45	39.84		19	15.64	.82	.54	75.07
ANNUAL FORBS	9.0				14	5.79	.41	.64	27.79
LEDE	.5	.03	.82		1				
PLPU	8.0	.40	10.99		13				
LATE	.5	.03	.82		1				
PERENNIAL FORBS									
*PHHO	.5	.03			1				
TOTAL		3.64	100.00			49.09			235.63

Precipitation Data:

R. G. #76 - Cochran Exclosure	
October 15 to April 15	= 2.40
April 15 to July 1	= 2.52
July 1 to September 1	= .85
September 1 to October 15	= .51
Season Total	= 6.28
Long Term Average	= 10.20

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Cochran Exc. Inside Pitted 7/28/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition	Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occurrences F $\div$ E	Wgt./ Unit Basal Area F $\div$ A	Pounds Per Acre F x 4.8
	A	B	C			E		
*ARTR	65.00	3.25		7				
POSE	11.00	.55	24.34	16	14.00	.86	1.27	67.20
AGSM	11.00	.55	24.34	18	26.10	1.45	2.37	125.28
BRTE	11.00	.55	24.34	19	15.81	.83	1.48	75.89
FEOC	8.5	.43	19.02	16	10.06	.63	1.18	48.29
ANNUAL FORBS	3.5							
PLPA	3.5	.18	7.96	8	3.82	.48	1.09	18.34
PERENNIAL FORBS				8				
*OPPO	30.5	1.53		1				
TOTAL		2.26	100.00		69.79			335.00

\*Not computed in percent composition

Precipitation Data:

R. G. #76 - Cochran Exclosure	=	2.40
October 15 to April 15	=	2.52
April 15 to July 1	=	.85
July 1 to September 1	=	.51
September 1 to October 15	=	6.28
Season Total	=	10.20
Long Term Average		

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Cumberland Exc. #1 Inside Native 8/17/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occurrences F E	Wgt./ Unit Basal Area F A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
ATNU	85	4.25	58.95		3	20.04	6.68	.24	96.19
*SAVE	39	1.95			3				
*ARTR	16	.80			3				
*CHVI	106	5.30			11				
POFE	21.5	1.08	14.98		7	18.56	2.65	.86	89.09
POSE	1	.05	.69		2	.16	.08	.16	.79
AGSM	34.5	1.73	24.00		18	37.73	2.10	1.09	181.11
ANNUAL FORBS	1				1	1.50	1.50	1.50	7.20
DEPI	1	.05	.69		1				
PERENNIAL FORBS	1				2	.38	.19	.38	1.82
VERONICA SPP.	1	.05	.69		2				
PHHO	29	1.45			6				
TOTAL		7.21	100.00			78.37			376.18

\*Not computed in percent composition

Precipitation Data:

R. G. #31 - Cumberland #1	
October 15 to April 15	=
April 15 to July 1	= 1.34
July 1 to September 1	= .84
September 1 to October 15	= 1.98
Season Total	= 4.16
Long Term Average	= 6.86

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Cumberland Exc. #1 Outside Native 8/17/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F $\frac{c}{e}$ E	Wgt./ Unit Basal Area F $\frac{c}{e}$ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
ATNU	82	4.1	84.71		8	28.45	3.56	.35	136.56
*SAVE	81	4.05			4				
*CHVI	11	.55			3				
*ARTR	58	2.90			2				
AGSM	11.5	.58	11.99		10	9.75	.98	.85	46.80
POFE	.5	.03	.62		1	.40	.40	.80	1.92
POSE	.5	.03	.62		1	.08	.08	.16	.38
ORHY	1	.05	1.03		1	1.03	1.03	1.03	4.94
ANNUAL FORBS	1								
DEPI	1	.05	1.03		1	.47	.47	.47	2.26
PERENNIAL FORBS									
*PHHO	25	1.25			5				
TOTAL		4.84	100.00			40.18			192.86
*Not computed in percent composition									

Precipitation Data;

R. G. #31 - Cumberland #1	
October 15 to April 15	=
April 15 to July 1	= 1.34
July 1 to September 1	= .84
September 1 to October 15	= 1.98
Season Total	= 4.18
Long Term Average	= 6.86

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Cumberland Exc. #1 Inside Sprayed 8/17/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F- $\frac{1}{2}$ -E	Wgt./ Unit Basal Area F- $\frac{1}{2}$ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
*CHVI	4.5	.23			6				
POSE	13	.65	16.62		9	2.01	.22	.15	9.65
POFE	41	2.05	52.43		9	24.60	2.73	.60	118.08
AGSM	16.5	.83	21.23		14	22.50	1.61	1.36	108.00
SIHY	7.5	.38	9.72		3	7.35	2.45	.98	35.28
TOTAL		3.91	100.00			56.46			271.01

\*Not computed in percent composition

Precipitation Data:

R. G. #31 - Cumberland #1	
October 15 to April 15	=
April 15 to July 1	= 1.34
July 1 to September 1	= .84
September 1 to October 15	= 1.98
Season Total	= 4.18
Long Term Average	= 6.86

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOCETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Cumberland Exc. #1 Outside Sprayed 8/17/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occurrences $F \frac{r}{r} E$	Wgt./ Unit Basal Area $F \frac{r}{r} A$	Pounds Per Acre $F \times 4.8$
	A	B	C		E	F	G	H	I
*CHVI	8.5	.43			5				
AGSM	12	.60	18.87		13	9.86	.76	.82	47.32
SIHY	15.5	.78	24.53		2	4.10	2.05	.26	19.68
POFE	27	1.35	42.45		8	3.79	.47	.14	18.19
POSE	7	.35	11.01		5	.62	.12	.09	2.98
ORHY	1	.05	1.57		1	.42	.42	.42	2.02
PERENNIAL FORBS	1				2				
UNKNOWN	1	.05	1.57		2	1.07	.54	1.07	5.14
TOTAL		3.18	100.00			19.86			95.33
*Not computed in percent composition									

Precipitation Data:

R. G. #31 - Cumberland #1	=
October 15 to April 15	= 1.34
April 15 to July 1	= .84
July 1 to September 1	= .84
September 1 to October 15	= 1.98
Season Total	= 4.18
Long Term Average	= 6.86

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

Cover Determined by Area Estimate

No. Plots 20

Cumberland Exc. #2 Inside Native 8/18/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F ÷ E	Wgt./ Unit Basal Area F ÷ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
CHVI	193.00	9.65			11				
*ARTR	197.50	9.88			10				
*UNK. SHRUB	16.00	.80			7				
AGSM	20.00	1.00	31.86		19	32.14	1.69	1.61	154.27
POFE	13.00	.65	20.70		5	5.92	1.18	.46	28.42
POA SPP.	10.00	.50	15.92		7	6.03	.86	.60	28.94
KOCR	8.50	.43	13.69		3	5.34	1.78	.63	25.63
POSE	6.00	.30	9.55		3	2.88	.96	.48	13.82
STIPA SPP.	2.50	.13	4.14		2	1.88	.94	.75	9.01
ANNUAL FORBS	2.50				5	.53	.11	.21	2.54
TRIFOLIUM SPP.	2.50	.13	4.14		5				
PERENNIAL FORBS									
*VERONICA SPP.	1.50	.08			3				
*PHMU	12.00	.60			2				
*CREPIS	1.00	.05			2				
*KK	12.50	.63			4				
*UNK. #1	2.00	.10			4				
*UNK. #2	6.00	.30			1				
TOTAL		3.14	100.00			54.72			262.65
*Not computed in percent composition									

Precipitation Data:

R. G. #32 - Cumberland #2	
October 15 to April 15	=
April 15 to July 1	= 6.03
July 1 to September 1	= .63
September 1 to October 15	= 2.00
Season Total	= 8.66
Long Term Average	= 7.18

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Cumberland Exc. #2 Outside Native 8/18/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences $F \div E$	Wgt./ Unit Basal Area $F \div A$	Pounds Per Acre $F \times 4.8$
	A	B	C		E	F	G	H	I
*ARCA	20.00	1.00			1				
*ARTR	218.00	10.90			13				
*CHVI	24.00	1.20			10				
*UNK. SHRUB	27.50	1.38			11				
AGSM	15.00	.75	22.52		18	14.72	.82	.98	70.66
POSE	25.00	1.25	37.54		11	9.06	.82	.36	43.49
POFE	7.00	.35	10.51		2	1.10	.55	.16	5.28
POA SPP.	12.50	.63	18.92		6	4.93	.82	.39	23.66
STIPA SPP.	5.00	.25	7.51		1	.56	.56	.11	2.69
ANNUAL FORBS									
TRIFOLIUM SPP.	2.00	.10	3.00		4				
PERENNIAL FORBS									
*VERONICA SPP.	2.50	.13			5				
*CREPIS SPP.	2.00	.10			4				
*ARABIS SPP.	.50	.03			1				
*ERI. SPP.	1.00	.05			1				
*KK	1.50	.08			2				
*UNK. FORB	.50	.03			1				
TOTAL		3.33	100.00			30.37			145.78
*Not computed	in percent composition								

Precipitation Data:

R. G. #32 - Cumberland #2	
October 15 to April 15	=
April 15 to July 1	= 6.03
July 1 to September 1	= .63
September 1 to October 15	= 2.00
Season Total	= 8.66
Long Term Average	= 7.18

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Cumberland Exc. #2 Inside Sprayed 8/18/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Cms/20 /sq.ft.	Average Weight Per Plot Occur- rences $F \div E$	Wgt./ Unit Basal Area $F \div A$	Pounds Per Acre $F \times 4.8$
	A	B	C		E	F	G	H	I
*ARCA	25.00	1.25			1				
*UNK. SHRUB	3.00	.15			2				
AGSM	34.00	1.70	40.00		18	65.16	3.62	1.92	312.77
POA SPP.	19.00	.95	22.35		8	39.30	4.91	2.07	188.64
POFE	24.00	1.20	28.24		7	40.14	5.73	1.67	192.67
POSE	6.00	.30	7.05		2	6.49	3.25	1.08	31.15
KOCR	1.00	.05	1.18		1	3.32	3.32	3.32	15.94
AGR. SPP.	1.00	.05	1.18		1	1.37	1.37	1.37	6.57
PERENNIAL FORBS									
*UNK. SPP.	4.00	.20			3				
TOTAL		4.25	100.00			155.78			747.74

\*Not computed in percent composition

Precipitation Data:

R. G. #32 - Cumberland #2	
October 15 to April 15	=
April 15 to July 1	= 6.03
July 1 to September 1	= .63
September 1 to October 15	= 2.00
Season Total	= 8.66
Long Term Average	= 7.18

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Cumberland Exc. #2 Outside Sprayed 8/18/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occurrences $F \div E$	Wgt./ Unit Basal Area $F \div A$	Pounds Per Acre $F \times 4.8$
	A	B	C		E	F	G	H	I
*CHVI	.50	.03			1				
*UNK. SPP.	5.50	.27			3				
AGSM	30.50	1.53	59.07		19	30.55	1.61	1.00	146.64
POA SPP.	7.50	.38	14.67		6	2.44	.41	.33	11.71
POFE	6.00	.30	11.59		2	1.40	.70	.23	6.72
POSE	7.50	.38	14.67		4	.89	.22	.19	4.27
PERENNIAL FORBS									
*VERONICA SPP.	1.50	.08			3				
*TRIFOLIUM SPP.	.50	.03			1				
*UNK. SPP.	7.00	.35			3				
TOTAL		2.59	100.00			35.28			169.34

\*Not computed in percent composition

Precipitation Data:

R. G. #3 2 - Cumberland #2	
October 15 to April 15	=
April 15 to July 1	= 6.03
July 1 to September 1	= .63
September 1 to October 15	= 2.00
Season Total	= 8.66
Long Term Average	= 7.18

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Cumberland Exc. #3 Inside Native Non-Spray 8/18/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F $\frac{--}{--}$ E	Wgt./ Unit Basal Area F $\frac{--}{--}$ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
*ARTR	549.00	27.45			13				
*UNK. SHRUB									
#1	20.50	1.03			5				
POA SPP.	6.00	.30	8.20		1	3.40	3.40	.57	16.32
POSE	40.00	2.00	54.65		11	18.84	1.71	.47	90.43
AGSM	10.50	.53	14.48		10	12.36	1.24	1.18	59.33
AGSP	4.00	.20	5.46		3	4.30	1.43	1.08	20.64
SIHY	2.50	.13	3.55		2	1.24	.62	.50	5.95
POFE	10.00	.50	13.66		1	8.10	8.10	.81	38.88
PERENNIAL FORBS									
*CHVI	11.00	.55			6				
*VIAM	.50	.03			1				
*PHHO	50.00	2.50			6				
*VERONICA SPP.	7.00	.35			12				
*TRIFOLIUM SPP.	5.00	.25			10				
*ARA SPP.	.50	.03			1				
*LOMATUM	1.00	.05			2				
*UNK #2	2.00	.10			2				
TOTAL		3.66	100.00			48.24			231.55
*Not computed in percent composition									

Precipitation Data:

R. G. #33 - Cumberland #3	
October 15 to April 15	= 5.53
April 15 to July 1	= 2.35
July 1 to September 1	= 1.07
September 1 to October 15	= 2.33
Season Total	= 11.28
Long Term Average	= 10.10

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Cumberland Exc. #3 Outside Non-Spray 8/18/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition	Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occurrences F $\div$ E	Wgt./ Unit Basal Area F $\div$ A	Pounds Per Acre F x 4.8
	A	B	C	E	F	G	H	I
*ARTR	297.00	14.85		12				
*UNK. SHRUB	4.00	.20		4				
SIHY	.50	.03	1.58	1	.24	.24	.48	1.15
AGSM	11.00	.55	28.95	14	10.20	.73	.93	48.96
POSE	15.50	.76	40.00	10	3.83	.38	.25	18.38
POFE	1.00	.05	2.63	2	.38	.19	.38	1.82
POA SPP.	9.00	.45	23.68	2	4.64	2.32	.52	22.27
ANNUAL FORBS	1.00			2	.02	.01	.02	.10
LARI	.50	.03	1.58	1				
DEPI	.50	.03	1.58	1				
PERENNIAL FORBS								
*PHHO	1.50	.07		3				
*CHVI	28.50	1.43		7				
*VIAM	1.00	.05		2				
*VERONICA SPP.	9.50	.48		17				
*TRIFOLIUM SPP.	6.00	.30		12				
*UNK #1	12.50	.63		4				
*UNK #2	10.00	.50		1				
TOTAL		1.90	100.00			19.31		92.68

\*Not computed in percent composition

Precipitation Data:

R. G. #33 - Cumberland #3	
October 15 to April 15	= 5.53
April 15 to July 1	= 2.35
July 1 to September 1	= 1.07
September 1 to October 15	= 2.33
Season Total	= 11.28
Long Term Average	= 10.10

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Cumberland Exc. #3 Inside Spray 8/18/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F $\div$ E	Wgt./ Unit Basal Area F $\div$ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
*ARNO	5.00	.25			1				
*UNK. FORB	7.50	.36			4				
POSE	28.00	1.40	27.39		12	25.24	2.10	.90	121.15
AGSM	29.00	1.45	28.38		20	56.50	2.83	1.95	271.20
AGSP	13.00	.65	12.72		6	16.36	2.73	1.26	78.53
STIPA	2.00	.10	1.96		1	1.45	1.45	.73	6.96
POFE	15.00	.75	14.68		3	15.06	5.02	1.00	72.29
POA	15.50	.76	14.87		6	10.64	1.77	.69	51.07
PERENNIAL FORBS									
*OPPO	.50	.03			1				
*LYJU	1.00	.05			1				
*VIAM	.50	.03			1				
*TRIFOLIUM SPP.	2.50	.13			5				
*VERONICA SPP.	7.50	.38			13				
TOTAL		5.11	100.00			125.25			601.20
*Not computed in percent composition									

Precipitation Data:

R. G. #33 - Cumberland #3	
October 15 to April 15	= 5.53
April 15 to July 1	= 2.35
July 1 to September 1	= 1.07
September 1 to October 15	= 2.33
Season Total	= 11.28
Long Term Average	= 10.10

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Cumberland Exc. #3 Outside Spray 8/18/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F → E	Wgt./ Unit Basal Area F → A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
*UNK. SHRUB	3.00	.15			1				
AGSP	32.00	1.60	39.70		7	30.20	4.31	.94	114.96
AGSM	19.00	.95	23.58		15	29.36	1.96	1.55	140.93
POFE	17.00	.85	21.09		7	8.30	1.19	.49	39.84
POSE	10.50	.53	13.15		9	7.45	.83	.71	35.76
SIHY	1.00	.05	1.24		1	2.38	2.38	2.38	11.42
POA SPP.	1.00	.05	1.24		1	.44	.44	.44	2.11
PERENNIAL FORBS									
*PHHO	1.00	.05			1				
*TRIFOLIUM SPP.	2.00	.10			4				
*VERONICA SPP.	5.50	.28			9				
TOTAL		4.03	100.00			78.13			345.02

\*Not computed in percent composition

Precipitation Data:

R. G. #33 - Cumberland #3	
October 15 to April 15	= 5.53
April 15 to July 1	= 2.35
July 1 to September 1	= 1.07
September 1 to October 15	= 2.33
Season Total	= 11.28
Long Term Average	= 10.10

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Cumberland #4 Inside 8/19/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occurrences F $\frac{g}{m^2}$ E	Wgt./ Unit Basal Area F $\frac{g}{m^2}$ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
*EULA *ATNU *ARSP AGSM ORHY	157.00 8.50 6.00 9.50 5.00	7.85 .43 .30 .48 .25		65.75 34.25	14 4 3 12 1				
PERENNIAL FORBS *PHHO	136.50	6.83			18	10.56 5.80	.88 5.80	1.11 1.16	50.69 27.84
TOTAL		.73	100.00			16.36			78.53

\*Not computed in percent composition

Precipitation Data:

R. G. #34 - Cumberland #4	
October 15 to April 15	=
April 15 to July 1	= 6.08
July 1 to September 1	= .99
September 1 to October 15	= 1.96
Season Total	= 9.03
Long Term Average	= 7.97

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Cumberland #4 Outside Native 8/19/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occurrences $F \div E$	Wgt./ Unit Basal Area $F \div A$	Pounds Per Acre $F \times 4.8$
	A	B	C		E	F	G	H	I
*ATNU *EULA *ARSP AGSM	61.5 71.00 2.00 9.50	3.08 3.55 .10 .48	90.57		3 9 1 12	10.22	.85	1.08	49.06
ANNUAL FORBS DEPI	1.00 1.00	.05	9.43		2 2	.02	.01	.02	.09
PERENNIAL FORBS *PHHO	205.50	10.28			17				
TOTAL		.53	100.00			10.24			49.15

\*Not computed in percent composition

Precipitation Data:

R. G. #34 - Cumberland #4	
October 15 to April 15	
April 15 to July 1	= 6.08
July 1 to September 1	= .99
September 1 to October 15	= 1.96
Season Total	= 9.03
Long Term Average	= 7.97

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Demer Exc. Inside 7/27/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F - E	Wgt./ Unit Basal Area F - A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
*ARTR	286.5	14.33			11				
SIHY	7.5	.38	12.30		3	3.95	1.32	.53	18.96
POSE	19.5	.98	31.72		14	6.40	.46	.33	30.72
AGSM	6.0	.3	9.71		12	4.78	.40	.80	22.94
FEOC	8.0	.4	12.95		16	.99	.06	.12	4.76
BRTE	4.5	.23	7.44		9	.38	.04	.08	1.83
BOGR	12	.6	19.41		7	2.59	.37	.22	12.43
ANNUAL FORBS	4.0				8	.08	.01	.02	.38
PLPA	4.0	.2	6.47		8				
*OPPO	43	2.15			3				
TOTAL		3.09	100.00			19.17			92.02

Precipitation Data:

R. G. #8 - Demer Exclosure	
October 15 to April 15	= 1.70
April 15 to July 1	= 1.87
July 1 to September 1	= .58
September 1 to October 15	= .85
Season Total	= 5.00
Long Term Average	= 7.62

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Demer Exc. Outside 7/27/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F ÷ E	Wgt./ Unit Basal Area F ÷ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
*ARTR	148	7.40			11				
AGSM	4	.20	4.52		7	2.37	.34	.59	11.38
FEOC	8.5	.43	9.73		17	1.58	.09	.19	7.58
POSE	7	.35	7.92		10	2.15	.22	.31	10.32
BRTE	5.5	.28	6.34		11	1.42	.13	.26	6.82
BOGR	55	2.80	63.35		9	5.53	.61	.10	26.54
ANNUAL FORBS	7								
PLPA	6.5	.33	7.47		13	1.19	.09	.17	5.71
DEPI	.5	.03	.67		13				
1					1				
*OPPO	3	.15			2				
TOTAL		4.42	100.00			14.24			68.35
*Not computed in percent composition									

Precipitation Data:

R. G. #8 - Demer Exclosure	
October 15 to April 15	= 1.70
April 15 to July 1	= 1.87
July 1 to September 1	= .58
September 1 to October 15	= .85
Season Total	= 5.00
Long Term Average	= 7.62

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 10

No. Plots 20

Cover Determined by Area Estimate

Dutch Nick Flat Inside Native 7/8/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency %Base 200	Total Weight Gms/200 /sq.ft.	Average Weight Per Plot Occurrences F $\div$ E	Wgt./ Unit Basal Area F $\div$ A	Pounds Per Acre F x .48
	A	B	C		E	F	G	H	I
ZULA	26	.13	.58		2	8.56	4.28	.33	4.11
BOGR	4305.0	21.53	95.48		195	184.4	.95	.04	88.51
POSE	65.0	.33	1.46		30	10.79	.36	.17	5.18
ANNUAL FORBS	111.0				175	52.55	.30	.47	25.22
PLPU	107.5	.54	2.40		175				
DEPI	1.0	.01	.04		2				
LEDE	2.5	.01	.04		5				
PERENNIAL FORBS									
*OPPO	525	2.63			60				
TOTAL		22.55	100.00			256.3			123.02

\*Not computed in percent composition

Precipitation Data:

R. G. #4 - Dutch Nick Flat	
October 15 to April 15	= 1.23
April 15 to July 1	= 1.56
July 1 to September 1	= 1.00
September 1 to October 15	= .76
Season Total	= 4.55
Long Term Average	= 6.77

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 10

No. Plots 20

Cover Determined by Area Estimate

Dutch Nick Flat Outside Native 7/9/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency %Base 200	Total Weight Gms/200 /sq.ft.	Average Weight Per Plot Occur- rences F $\leq$ E	Wgt./ Unit Basal Area F $\leq$ A	Pounds Per Acre F x .48
	A	B	C		E	F	G	H	I
RSP	5.5	.03	.11		2	.20	.10	.04	.10
BOGR	4676.5	23.38	89.28		198	199.56	1.01	.04	95.78
POSE	435.0	2.18	8.32		40	6.58	.16	.02	3.16
SIHY	12.5	.06	.23		6	4.57	.76	.37	2.19
ANNUAL FORBS	104.5				171	47.47	.28	.45	22.79
PLPU	97	.49	1.87		168				
MATA	7	.04	.15		7				
LEDE	.5	.01	.04		1				
PERENNIAL FORBS									
*OPPO	1182.5	5.91			81				
TOTAL		26.19	100.00			258.38			124.02
*Not computed in percent composition									

Precipitation Data:

R. G. #4 - Dutch Nick Flat	
October 15 to April 15	= 1.23
April 15 to July 1	= 1.56
July 1 to September 1	= 1.00
September 1 to October 15	= .76
Season Total	= 4.55
Long Term Average	= 6.77

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Farson Inside Native 8/17/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F--E	Wgt./ Unit Basal Area F--A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
MARTR	293.00	14.65			14				
AGSM	14.00	.70	43.48		18	10.81	.60	.77	51.89
SIHY	2.50	.13	8.07		3	2.38	.79	.95	11.42
ORHY	5.50	.28	17.39		3	3.17	1.06	.58	15.21
POSE	5.00	.25	15.53		1	2.44	2.44	.49	11.70
STCO	5.00	.25	15.53		2	2.02	1.01	.40	9.67
PERENNIAL FORBS									
*PHHO	8.50	.43			4				
*CHVI	8.00	.40			2				
*LES SPP.	1.00	.50			1				
TOTAL		1.61	100.00			20.82			99.90
*Not computed in percent composition									

Precipitation Data:

R. G. #2 - Farson Exclosure	
October 15 to April 15	= 2.25
April 15 to July 1	= 1.31
July 1 to September 1	= 1.04
September 1 to October 15	= 1.24
Season Total	= 5.84
Long Term Average	= 5.47

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Farson Outside Native 8/17/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F ÷ E	Wgt./ Unit Basal Area F ÷ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
*ARTR SIHY AGSM STCO	71.00 1.50 14.50 1.00	3.55 .08 .73 .05	9.30 84.88 5.82		12 2 16 1	.22 6.55 .08	.11 .41 .08	1.47 .45 .08	1.06 31.44 .38
PERENNIAL FORBS *CHVI *PHHO	29.00 9.50	1.45 .48			10 7				
TOTAL		.86	100.00			6.85			32.88

\*Not computed in percent composition

Precipitation Data:

R. G. #2 - Farson Exclosure	
October 15 to April 15	= 2.25
April 15 to July 1	= 1.31
July 1 to September 1	= 1.04
September 1 to October 15	= 1.24
Season Total	= 5.84
Long Term Average	= 5.47

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Granite Mountain Inside Native 8/22/66	Total Trans. Basal Area Percent	Average Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F--E	Wgt./ Unit Basal Area F--A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
*ARTR SIHY AGSM POFE	360 .5 16 69.5	18 .03 .80 3.48	.66 17.62 76.65		16 1 19 17	.30 15.55 .82 30.0	.30 1.76	.60 .97 .97 .43	1.44 74.64 144.0
PERENNIAL FORBS *PHHO ERICERON SPP. UNK.	4.5 35.5 2.5 2	1.78  .13 .10	2.87  2.20		5 7 4 1	1.86	.37	.04	8.93
TOTAL		4.54	100.00			47.71			229.01

\*Not computed in percent composition

Precipitation Data:

R. G. #2 - Granite Mountain Exclosure	
October 15 to April 15	= 1.32
April 15 to July 1	= 2.43
July 1 to September 1	= 2.28
September 1 to October 15	= 2.04
Season Total	= 8.07
Long Term Average	= 8.08

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Granite Mountain Outside Native 8/22/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F $\div$ E	Wgt./ Unit Basal Area F $\div$ A	Pounds Per Acre F $\times$ 4.8
	A	B	C		E	F	G	H	I
*ARTR SIHY AGSM POFE	304.5 1 12.5 75	15.23 .05 .63 3.75	1.08 13.58 80.82		16 1 16 19	.83 14.60 19.57	.83 .91 1.03	.83 1.17 .26	3.98 70.08 93.94
PERENNIAL FORBS ERICERON SPP.	4.0				7	2.23	.32	.56	10.70
*PHHO ASTRAGALUS SPP. LESQUERELLA SPP.	31.5 2 .5	1.58 .10 .03	1.72 2.15 .65		3 6 3 1				
TOTAL		4.64	100.00			37.23			178.70
*Not computed in percent composition									

Precipitation Data:

R. G. #2 - Granite Mountain Exclosure	
October 15 to April 15	= 1.32
April 15 to July 1	= 2.43
July 1 to September 1	= 2.28
September 1 to October 15	= 2.04
Season Total	= 8.07
Long Term Average	= 8.08

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
 (PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Granite Mountain Inside Sprayed 8/22/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F <sub>c</sub> E	Wgt./ Unit Basal Area F <sub>c</sub> A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
*ARTR AGSM POFE	48 46.5 102	2.4 2.33 5.1	31.36 68.64		4 18 16	96.03 47.77	5.34 2.99	2.07 .47	460.94 229.30
PERENNIAL FORBS *PHHO	.5	.03			1				
TOTAL		7.43	100.00			143.80			690.24

\*Not computed in percent composition

Precipitation Data:

R. G. #2 - Granite Mountain Exclosure  
 October 15 to April 15 = 1.32  
 April 15 to July 1 = 2.43  
 July 1 to September 1 = 2.28  
 September 1 to October 15 = 2.04  
 Season Total = 8.07  
 Long Term Average = 8.08

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Granite Mountain Outside Sprayed 8/22/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F → E	Wgt./ Unit Basal Area F → A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
*ARTR AGSM POFE	38 35 27.5	1.90 1.75 1.38	52.71 52.71 41.57		5 20 16	35.64 10.32	1.78 .65	1.02 .38	171.07 49.54
PERENNIAL FORBS ASTRAGALUS SPP. ERIGERON SPP. TRIFOLIUM SPP. *PHHO LESQUERELLA SPP.	3.5 .5 1.5 .5 6.5 1	.03 .03 .08 .03 .33 .05	.90 .90 2.41 .90 1.51		5 1 2 1 7 2	2.43	.49	.69	11.66
TOTAL		3.32	100.00			48.39			232.27
*Not computed in percent composition									

Precipitation Data:

R. G. #2 - Granite Mountain Exclosure	
October 15 to April 15	= 1.32
April 15 to July 1	= 2.43
July 1 to September 1	= 2.28
September 1 to October 15	= 2.04
Season Total	= 8.07
Long Term Average	= 8.08

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 10

No. Plots 20

Cover Determined by Area Estimate

Halogeton Pasture Exc. #1 7/11/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition	Absolute Plot Frequency % Base200	Total Weight Gms/200 /sq.ft.	Average Weight Per Plot Occur- rences F ÷ E	Wgt./ Unit Basal Area F ÷ A	Pounds Per Acre F x .48
	A	B	C	E	F	G	H	I
ATNU	2875.5	14.38	94.16	152	376.55	2.48	.13	180.74
ARSP	5.5	.03	.20	3	.39	.13	.07	.19
POSE	160	.80	5.24	30	42.93	1.43	.27	20.61
SIHY	10	.05	.33	6	5.85	.98	.59	2.81
PERENNIAL FORBS	1			1	.50	.5	.5	.24
UNK.	1	.01	.07	1				
*OPPO	183	.92		8				
TOTAL		15.27	100.00		426.22			204.59

\*Not computed in percent composition

Precipitation Data:

R. G. #24 - Halogeton Pastures

October 15 to April 15	= .35
April 15 to July 1	= .74
July 1 to September 1	= .45
September 1 to October 15	= .62
Season Total	= 2.16
Long Term Average	= 5.13

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 10

Cover Determined by Area Estimate

No. Plots 20

Halogeton Pasture Exc. #2 7/12/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency %Base 200	Total Weight Gms/200 /sq.ft.	Average Weight Per Plot Occur- rences F ÷ E	Wgt./ Unit Basal Area F ÷ A	Pounds Per Acre F x .48
	A	B	C		E	F	G	H	I
MATNU *ARTR	3122 2	15.61 .01	86.96		167 1	621.31	3.72	.20	298.23
SIHY	281	1.41	7.86		62	135.02	2.18	.48	64.81
POSE	125.5	.63	3.51		37	51.8	1.40	.41	24.86
ANNUAL FORBS	58.5				89				
MATA	10.5	.05	.28		17				
LATE	17.0	.09	.50		32				
LEDE	7.0	.04	.22		14				
DEPI	24.0	.12	.67		47				
PERENNIAL FORBS									
*OPPO	14	.07			3				
TOTAL		17.95	100.00			818.77			393.01

\*Not computed in percent composition

Precipitation Data:

R. G. #24 - Halogeton Pasture Exc. #2	
October 15 to April 15	= .35
April 15 to July 1	= .74
July 1 to September 1	= .45
September 1 to October 15	= .62
Season Total	= 2.16
Long Term Average	= 5.13

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 10

No. Plots 20

Cover Determined by Area Estimate

Halogen Pasture Exc. #3 7/12/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency %Base 200	Total Weight Gms/200 /sq.ft.	Average Weight Per Plot Occur- rences F ÷ E	Wgt./ Unit Basal Area F ÷ A	Pounds Per Acre F x .48
	A	B	C		E	F	G	H	I
ATNU SIHY	3398.5 47.5	16.99 .24	97.53 1.38		153 20	502.93 32.36	3.29 1.62	.15 .68	241.41 15.53
ANNUAL FORBS	36.5				53	9.52	.18	.26	4.57
MATA	21	.11	.63		34				
LATE	10.5	.05	.29		20				
DEPI	5	.03	.17		10				
PERENNIAL FORBS *OPPO	25.5	.13			2				
TOTAL		17.42	100.00			544.81			261.51

\*Not computed in percent composition

Precipitation Data:

R. G. #24 - Halogen Pastures Exc. #3	
October 15 to April 15	= .35
April 15 to July 1	= .74
July 1 to September 1	= .45
September 1 to October 15	= .62
Season Total	= 2.16
Long Term Average	= 5.13

## HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.

(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 10

No. Plots 20

## Cover Determined by Area Estimate

Halogeton Pasture #1	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency %Base 200	Total Weight Gms/200 /sq.ft.	Average Weight Per Plot Occurrences $F \div E$	Wgt./ Unit Basal Area $F \div A$	Pounds Per Acre $F \times .48$
	A	B	C		E	F	G	H	I
ATNU	1935.0	9.68	98.98		134	269.31	2.01	.14	129.27
ARSP	20	.10	1.02		2	.66	.33	.03	.32
PERENNIAL FORBS									
*OPPO	88	.44			9				
TOTAL		9.78	100.00			269.97			129.59
<hr/>									
*Not computed in percent composition									
Halogeton Past. #5									
7/14/66									
ATNU	2490.5	12.45	99.20		182	283.93	1.56	.11	136.29
SIHY	12.5	.06	.48		7	5.55	.79	.44	2.66
ANNUAL FORBS	6.5				11	3.35	.30	.52	1.61
LATE	3.5	.02	.16		7				
MATA	2.5	.01	.08		5				
DEPI	.5	.01	.08		1				
PERENNIAL FORBS									
*OPPO	12	.06			5				
TOTAL		12.55	100.00			292.83			140.56
<hr/>									
*Not computed in percent composition									

## Precipitation Data:

R. G. #24 - Halogeton Pastures

October 15 to April 15	= .35
April 15 to July 1	= .74
July 1 to September 1	= .45
September 1 to October 15	= .62
Season Total	= 2.16
Long Term Average	= 5.13

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 10

No. Plots 20

Cover Determined by Area Estimate

Halogeton Pasture #2 7/13/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency %Base 200	Total Weight Gms/200 /sq.ft.	Average Weight Per Plot Occur- rences F ÷ E	Wgt./ Unit Basal Area F ÷ A	Pounds Per Acre F x .48
	A	B	C		E	F	G	H	I
ATNU	379.5	1.90	100.00		126	58.64	.47	.5	28.15
TOTAL		1.90	100.00			58.64			28.15
Halogenet Past. #6 7/16/66									
ATNU SIHY	354.5 33.5	1.77 .18	89.39 9.09		93 25	104.60 5.87	1.12 .23	.30 .18	50.21 2.82
ANNUAL FORBS MATA	6 6	.03	1.52		11 11	.72	.07	.12	.34
TOTAL		1.98	100.00			111.19			53.37

Precipitation Data:

R. G. #24 - Halogeton Pastures

October 15 to April 15	= .35
April 15 to July 1	= .74
July 1 to September 1	= .45
September 1 to October 15	= .62
Season Total	= 2.16
Long Term Average	= 5.13

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 10

No. Plots 20

Cover Determined by Area Estimate

Halogenet Pasture #4a 7/13/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency %Base 200	Total Weight Gms/200 /sq.ft.	Average Weight Per Plot Occur- rences F → E	Wgt./ Unit Basal Area F → A	Pounds Per Acre F x .48
	A	B	C		E	F	G	H	I
ATNU SIHY	1620.0 2.5	8.10 .01	99.88 .12		158 2	215.04 2.35	1.36 1.18	.13 .94	103.22 1.13
TOTAL		8.11	100.00			217.39			104.35
Halogenet Past. #4b <u>7/14/66</u>									
ATNU SIHY	1953.5 1	9.77 .01	99.90 .10		163 1	221.51 .75	1.36 .75	.11 .75	106.32 .36
PERENNIAL FORBS *OPPO	134	.65			8				
TOTAL *Not computed in percent composition		9.78	100.00			222.26			106.68

Precipitation Data:

R. G. #24 - Halogenet Pastures

October 15 to April 15	= .35
April 15 to July 1	= .74
July 1 to September 1	= .45
September 1 to October 15	= .62
Season Total	= 2.16
Long Term Average	= 5.13

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 10

No. Plots 20

Cover Determined by Area Estimate

Halogeton Pasture #7a	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition	Absolute Plot Frequency %Base 200	Total Weight Gms/200 /sq.ft.	Average Weight Per Plot Occurrences F $\frac{1}{E}$	Wgt./ Unit Basal Area F $\frac{1}{A}$	Pounds Per Acre F x .48
	A	B			F	G		I
ATNU	2102	10.51	98.23	131	372.94	2.85	.18	179.01
SIHY	19	.10	.93	12	5.78	.48	.30	2.77
ANNUAL FORBS	17.5				22			
MATA	17.5	.09	.84	22	3.33	.15	.19	1.60
PERENNIAL FORBS								
*OPPO	5.5	.03			4			
TOTAL		10.70	100.00			382.05		183.38
<i>*Not computed in percent composition</i>								
Halogeton Past. #7b 7/16/66								
ATNU	1081.0	5.41	96.43		127	133.19	1.05	.12
SIHY	20.5	.10	1.79		14	4.35	.31	.21
ANNUAL FORBS	19.5				35			
MATA	19.5	.10	1.78		35	3.70	.11	.19
PERENNIAL FORBS								
*OPPO	25.5	.13			5			
TOTAL		5.61	100.00			414.24		67.80
<i>*Not computed in percent composition</i>								

Precipitation Data:

R. G. #24 - Halogeton Pastures	
October 15 to April 15	= .35
April 15 to July 1	= .74
July 1 to September 1	= .45
September 1 to October 15	= .62
Season Total	= 2.16
Long Term Average	= 5.13

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Horse Creek Inside AGSM 8/2/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F $\frac{g}{m^2}$ E	Wgt./ Unit Basal Area F $\frac{g}{m^2}$ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
*ARTR AGSM POSE	124.50 34.00 9.00	6.23 1.70 .45	79.07 20.93		6 20 12	69.84 7.16	3.49 .60	2.05 .80	335.23 34.37
PERENNIAL FORBS *OPPO	3.00	.15			1				
TOTAL		2.15	100.00			77.00			369.60

\*Not computed in percent composition

Precipitation Data:

R. G. #12 - Horse Creek Exclosure	
October 15 to April 15	= 2.36
April 15 to July 1	= 1.78
July 1 to September 1	= 1.07
September 1 to October 15	= 1.09
Season Total	= 6.30
Long Term Average	= 10.73

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Horse Creek Outside AGSM 8/2/66	Total Trans. Basal Area Percent	Average Basal Area Percent	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occurrences F $\frac{#}{\text{E}}$	Wgt./ Unit Basal Area F $\frac{#}{\text{A}}$	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
*ARTR	219.00	10.95			14				
POSE	10.00	.50	42.37		10	3.08	.31	.31	14.78
AGSM	11.00	.55	46.62		17	12.23	.72	1.11	58.70
AGSP	2.50	.13	11.01		5	3.46	.69	1.38	16.61
PERENNIAL FORBS									
*PHHO	3.50	.16			5				
TOTAL		1.18	100.00			18.77			90.09

\*Not computed in percent composition

Precipitation Data:

R. G. #12 - Horse Creek Exclosure	
October 15 to April 15	= 2.36
April 15 to July 1	= 1.78
July 1 to September 1	= 1.07
September 1 to October 15	= 1.09
Season Total	= 6.30
Long Term Average	= 10.73

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

Cover Determined by Area Estimate

No. Plots 20

Horse Creek Inside AGSP 8/2/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F $\frac{r}{r}$ E	Wgt./ Unit Basal Area F $\frac{r}{r}$ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
ARTR	236.00	11.80			10				
AGSP	25.00	1.25	63.78		13	30.04	2.31	1.20	144.19
AGSM	10.50	.53	27.04		11	15.59	1.42	1.48	74.83
POSE	3.50	.18	9.18		5	1.65	.33	.47	7.92
PERENNIAL FORBS									
*OPPO	18.00	.90			4				
*PHHO	.50	.03			1				
TOTAL		1.96	100.00			47.28			226.94
*Not computed in percent composition									

Precipitation Data:

R. G. #12 - Horse Creek Exclosure	
October 15 to April 15	= 2.36
April 15 to July 1	= 1.78
July 1 to September 1	= 1.07
September 1 to October 15	= 1.09
Season Total	= 6.30
Long Term Average	= 10.73

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

Cover Determined by Area Estimate

No. Plots 20

Horse Creek Outside AGSP 8/2/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F ÷ E	Wgt./ Unit Basal Area F ÷ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
*ARTR	233.00	11.65			9				
*GUSA	15.00	.75			10				
AGSM	6.00	.30	26.10		11	6.00	.55	1.00	28.80
AGSP	12.00	.60	52.17		7	9.86	1.41	.82	47.33
POSE	5.00	.25	21.73		9	2.49	.28	.49	11.95
PERENNIAL FORBS									
*OPPO	31.00	1.55			3				
*SPCO	1.50	.08			3				
*PHHO	2.50	.13			5				
TOTAL		1.15	100.00			18.35			88.08

\*Not computed in percent composition

Precipitation Data:

R. G. #12 - Horse Creek Exclosure	
October 15 to April 15	= 2.36
April 15 to July 1	= 1.78
July 1 to September 1	= 1.07
September 1 to October 15	= 1.09
Season Total	= 6.30
Long Term Average	= 10.73

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Kirby Creek Inside Native 7/20/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition	Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F $\div$ E	Wgt./ Unit Basal Area F $\div$ A	Pounds Per Acre F $\times$ 4.8
	A	B	C	E	F	G	H	I
*SAVE	115.0	5.75		6				
AGSM	10.0	.50	25.51	14	20.55	1.47	2.06	98.64
POSE	22.5	1.13	57.65	7	7.46	1.07	.33	35.81
BRTE	6.5	.33	16.84	9	6.36	.71	.98	30.53
TOTAL		1.96	100.00		34.37			164.98

\*Not computed in percent composition

Precipitation Data:

R. G. #77 - Kirby Creek Exclosure

October 15 to April 15	= 2.20
April 15 to July 1	= 2.30
July 1 to September 1	= .70
September 1 to October 15	= .75
Season Total	= 5.95
Long Term Average	= 8.29

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Kirby Creek Outside Native 7/20/66	Total Trans. Basal Area Percent	Average Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F $\div$ E	Wgt./ Unit Basal Area F $\div$ A	Pounds Per Acre F $\times$ 4.8
	A	B	C		E	F	G	H	I
*SAVE AGSM POSE BRTE	499.0 11.5 3 .5	24.95 .58 .15 .03	73.42 18.98 3.80		13 10 2 1	11.92 .91 .04	1.19 .46 .04	1.04 .30 .08	57.23 4.36 .19
ANNUAL FORBS SAKA	.5 .5	.03	3.80		1 1				
TOTAL		.79	100.00			12.87			61.78

\*Not computed in percent composition

Precipitation Data:

R. G. #77 - Kirby Creek Exclosure

October 15 to April 15	= 2.20
April 15 to July 1	= 2.30
July 1 to September 1	= .70
September 1 to October 15	= .75
Season Total	= 5.95
Long Term Average	= 8.29

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Lower Gov.Draw Inside Non-spray 8/24/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F $\frac{+}{-}$ E	Wgt./ Unit Basal Area F $\frac{-}{+}$ A	Pounds Per Acre F $\times$ 4.8
	A	B	C		E	F	G	H	I
*ARTR	413.50	20.68			9				
BRTE	4.00	.20	8.00		8	6.25	.78	1.56	30.00
AGSM	20.00	1.00	40.00		20	39.07	1.95	1.95	187.54
POSE	19.00	.95	38.00		15	16.87	1.12	.89	80.97
STCO	7.00	.35	14.00		3	10.26	3.42	1.47	49.25
TOTAL		2.50	100.00			72.45			347.76

\*Not computed in percent composition

Precipitation Data:

R. G. #77 - Lower Gov't Draw Enclosure	
October 15 to April 15	= 2.80
April 15 to July 1	= 2.71
July 1 to September 1	= 1.90
September 1 to October 15	= 2.83
Season Total	= 10.24
Long Term Average	= 10.04

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Lower Gov. Draw Outside Native 8/24/66	Total Trans. Basal Area Percent	Average Basal Area Percent	Percent Compo-sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur-rences F ÷ E	Wt./ Unit Basal Area F ÷ A	Pounds Per Acre F x 4.8
*ARTR	460.00	23.00			11	.85	.85	.85	4.08
OCR	1.00	.05	2.46		1				
OSE	11.00	.55	27.09		12	9.18	.77	.83	44.06
AGSM	9.00	.45	22.18		16	12.47	.78	1.39	59.85
BRTE	8.50	.43	21.18		15	11.50	.77	1.35	55.20
FEOC	3.00	.15	7.39		6	2.34	.39	.78	11.23
STCO	8.00	.40	19.70		4	3.05	.76	.38	14.65
PERENNIAL FORBS									
*SPCO	.50	.03			1				
TOTAL		2.03	100.00			39.39			189.07
*Not computed in percent composition									

Precipitation Data:

R. G. #77 - Lower Gov't Draw Exclosure  
 October 15 to April 15 = 2.80  
 April 15 to July 1 = 2.71  
 July 1 to September 1 = 1.90  
 September 1 to October 15 = 2.83  
 Season Total = 10.24  
 Long Term Average = 10.04

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Lower Gov.Draw Inside Spray 8/24/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo-sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur-rences F ÷ E	Wgt./ Unit Basal Area F ÷ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
OSE	24.50	12.25	28.51		15	20.02	1.33	.82	96.10
STCO	41.00	20.50	47.72		12	74.85	6.24	1.83	359.28
AGSM	19.50	9.75	22.70		20	52.57	2.63	2.70	252.33
BRTE	5.00	.25	.58		9	5.95	.66	1.19	28.56
ANNUAL FORBS	4.00								
PLPA	1.00	.05	.12		8	5.05	.63	1.26	24.24
LEDE	.50	.03	.07		2				
CAMI	2.50	.13	.30		1				
TOTAL		42.96	100.00			158.44			760.51

Precipitation Data:

R. G. #77 - Lower Gov't. Draw Exclosure  
 October 15 to April 15 = 2.80  
 April 15 to July 1 = 2.71  
 July 1 to September 1 = 1.90  
 September 1 to October 15 = 2.83  
 Season total = 10.24  
 Long Term Average = 10.04

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

Cover Determined by Area Estimate

No. Plots 20

Lower Gov.Draw Outside Spray 8/24/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F → E	Wgt./ Unit Basal Area F → A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
AGSM	14.50	.73			19	6.57	.35	.45	31.54
POSE	46.00	2.30			20	7.41	.37	.16	35.57
BRTE	2.50	.13			5	.72	.14	.29	3.45
STCO	9.10	.46			5	2.08	.42	.23	9.98
TOTAL		3.62				16.78			80.54

Precipitation Data:

R. G. #77 - Lower Gov't Draw Exclosure  
 October 15 to April 15 = 2.80  
 April 15 to July 1 = 2.71  
 July 1 to September 1 = 1.90  
 September 1 to October 15 = 2.83  
 Season Total = 10.24  
 Long Term Average = 10.04

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

McGraw Flat Inside Native 8/23/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F ÷ E	Wgt./ Unit Basal Area F ÷ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
*ARTR	374.50	18.73			18				
AGSM	17.00	.85			20	23.49	1.17	1.38	112.75
POFE	71.00	3.55	67.23		13	24.60	1.89	.35	118.08
POSE	17.50	.88	16.67		12	6.81	.57	.39	32.69
PERENNIAL FORBS									
*SPCO	1.00	.05			2				
*PHHO	24.60	1.23			9				
*MAGR	.50	.03			1				
*LOMATIUM SPP.	1.50	.08			3				
TOTAL		5.28	100.00			54.90			263.52
*Not computed in percent composition									

Precipitation Data:

R. G. #14 - McGraw Flat	
October 15 to April 15	= 2.70
April 15 to July 1	= 2.48
July 1 to September 1	= 1.19
September 1 to October 15	= 1.60
Season Total	= 7.97
Long Term Average	= 8.95

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

McGraw Flat Outside Native 8/23/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occurrences F $\frac{1}{\pi}$ E	Wgt./ Unit Basal Area F $\frac{1}{\pi}$ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
*ARTR	567.50	28.38			19				
*CHVI	1.00	.05			1				
AGSM	11.00	.55	18.58		19				
POFE	25.50	1.28	43.24		13				
POSE	22.00	1.10	37.16		12				
ANNUAL FORBS	.50								
SAKA	.50	.03	1.02						
					1				
					1				
PERENNIAL FORBS									
*VIAM	.50	.03							
*PHHO	28.50	1.43							
*SPCO	.50	.03							
*ARABIS SPP	.50	.03							
*UNK. SPP #1	7.50	.38							
TOTAL		2.96	100.00				26.31		126.29
*Not computed in percent composition									

PrecipitationData:

R. G. #14 - McGraw Flat	
October 15 to April 15	= 2.70
April 15 to July 1	= 2.48
July 1 to September 1	= 1.19
September 1 to October 15	= 1.60
Season Total	= 7.97
Long Term Average	= 8.95

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

North Butte Relic 7/29/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F <sub>-</sub> E	Wgt./ Unit Basal Area F <sub>-</sub> A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
*ARTR	26	.30			5				
AGSM	1.5	.08	2.65		3		.17	.35	2.50
AGSP	34.5	1.73	57.29		16	35.44	2.22	1.03	170.11
POSE	6	.30	9.93		8		.84	.11	.14
STCO	2	.10	3.31		1		1.04	1.04	4.03
CAFI	13	.65	21.52		4	2.36	.59	.18	4.99
ANNUAL FORBS	.5								
DEPI	.5	.03	.99		1		.01	.01	.02
							1		.05
PERENNIAL FORBS	2.5								
SPCO	2.5	.13			5		.23	.05	.09
*PHHO	14	7.0	4.31		5				1.10
					10				
TOTAL		3.02	100.00			40.44			194.11
*Not computed in percent composition									

Precipitation Data:

R. G. #79 - Thermopolis Weather Bureau Station

Discontinued 7/1/65

Long Term Average = 13.69

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Round Top Relic 7/29/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F - E	Wgt./ Unit Basal Area F - A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
AGSP	78	3.90	59.72		16	96.92	6.06	1.24	465.21
POSE	6	.30	4.59		11	1.67	.15	.28	8.01
STCO	7	.35	5.35		2	4.62	2.31	.66	22.18
BRTE	.5	.03	.46		1	.01	.01	.02	.05
CAFI	31	1.55	23.74		12	8.71	.73	.28	41.81
ANNUAL FORBS	5.0				8	.61	.08	.12	2.93
LATE DEPI	1.5 3.5	.08 .18	1.23 2.76		3 7				
PERENNIAL FORBS	2.5				5	1.97	.39	.79	9.46
UNK. #1	1.5	.08	1.23		3				
UNK. #2	.5	.03	.46		1				
UNK. #3	.5	.03	.46		1				
TOTAL		6.53	100.00			114.51			549.65

Precipitation Data:

R. G. #79 - Thermopolis Weather Bureau  
Discontinued 7/1/65  
Long Term Average = 13.69

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 10

No. Plots 20

Cover Determined by Area Estimate

Sand Gulch Inside Native 7/19/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency %Base 200	Total Weight Gms/200 /sq.ft.	Average Weight Per Plot Occurrences F → E	Wgt./ Unit Basal Area F → A	Pounds Per Acre F × .48
	A	B	C		E	F	G	H	I
ATNU	1910.0	9.55	72.90		110	353.89	3.22	.19	169.87
BRJA	.5	.01	.08		1	.29	.29	.58	.14
BRTE	230	1.15	8.77		170	154.06	.91	.67	73.95
POSE	23	.12	.92		23	14.41	.63	.63	6.92
SIHY	26.5	1.33	10.15		19	47.53	2.50	1.79	22.81
ORHY	22	.11	.84		3	14.93	4.98	.68	7.17
AGSM	113	.57	4.35		133	133.86	1.01	1.18	64.25
BOGR	48	.24	1.83		5	10.4	2.08	.22	4.99
ANNUAL FORBS	1.5								
LATE	1	.01	.08		3	.48	.16	.32	.23
LEDE	.5	.01	.08		2				
PERENNIAL FORBS					1				
*OPPO	31				3				
TOTAL		13.10	100.00			729.85			350.33
*Not computed in percent composition									

Precipitation Data:

R. G. #75 - Sand Gulch	
October 15 to April 15	= 1.90
April 15 to July 1	= 1.99
July 1 to September 1	= .83
September 1 to October 15	= .42
Season Total	= 5.14
Long Term Average	= 8.91

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 10

No. Plots 20

Cover Determined by Area Estimate

Sand Gulch Outside Native 7/19/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency %Base 200	Total Weight Gms/200 /sq.ft.	Average Weight Per Plot Occur- rences F → E	Wgt./ Unit Basal Area F → A	Pounds Per Acre F × .48
	A	B	C		E	F	G	H	I
ATNU	1891	9.46	77.86		98	481.97	4.92	.25	231.34
AGSM	53	.27	2.22		72	35.86	.50	.68	17.21
BOGR	383	1.92	15.80		49	27.18	.55	7.10	13.04
BRTE	80	.40	3.30		117	52.64	.45	.66	25.27
POSE	10.5	.05	.41		14	3.43	.25	.33	1.65
SIHY	8.5	.04	.33		7	2.24	.32	.26	1.08
MUSG	.5	.01	.08		1	.01	.01	.02	.01
PERENNIAL FORBS *OPPO	620				45				
TOTAL		12.15	100.00			603.33			289.60
*Not computed in percent composition									

Precipitation Data:

R. G. #75 - Sand Gulch	
October 15 to April 15	= 1.90
April 15 to July 1	= 1.99
July 1 to September 1	= .83
September 1 to October 15	= .42
Season Total	= 5.14
Long Term Average	= 8.91

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Smilo Exc. Inside Native 7/27/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F → E	Wgt./ Unit Basal Area F → A	Pounds Per Acre F × 4.8
	A	B	C		E	F	G	H	I
*ARTR	304.5	15.23			13				
SIHY	2	.10	5.10		3	1.04	.35	.52	4.99
FEOC	6.5	.33	16.84		13	.80	.06	.12	3.84
BRTE	1	.05	2.55		2	.25	.13	.25	1.20
POSE	13	.65	33.16		11	2.62	.24	.20	12.58
AGSM	9	.45	22.96		13	9.28	.71	1.03	44.55
BOGR	4	.20	10.21		1	.78	.78	.20	3.74
ANNUAL FORBS	3.5				7				
PLPU	2.5				5				
DEPI	1				2				
PERENNIAL FORBS									
*OPPO	28	1.4			2				
TOTAL		1.96	100.00			15.55			74.64
*Not computed in percent composition									

Precipitation Data:

R. G. #36 - Smilo Exclosure	
October 15 to April 15	= 2.08
April 15 to July 1	= 1.74
July 1 to September 1	= .50
September 1 to October 15	= .96
Season Total	= 5.28
Long Term Average	= 7.93



HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

Cover Determined by Area Estimate

No. Plots 20

Smilo Exc. Inside Sprayed 7/27/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occurrences F ÷ E	Wgt./ Unit Basal Area F ÷ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
SARTR	.5	.03			1				
SIHY	14	.70	18.67		10	11.31	1.13	.81	54.28
POSE	22	1.10	29.33		16	6.91	.43	.31	33.17
AGSM	10	.50	13.33		15	11.41	.76	1.14	54.77
FEOC	9	.45	12.00		17	2.50	.15	.28	12.00
BRTE	11	.55	14.67		14	5.07	.36	.46	24.34
STCO	5	.25	6.67		2	2.61	1.31	.52	12.53
ANNUAL FORBS	4								
PLPU	4	.20	5.33		7	.48	.07	.12	2.30
PERENNIAL FORBS									
*OPPO	4	.20			1				
TOTAL		3.75	100.00			40.29			193.39

\*Not computed in percent composition

Precipitation Data:

R. G. #36 - Smilo Exclosure	
October 15 to April 15	= 2.08
April 15 to July 1	= 1.74
July 1 to September 1	= .50
September 1 to October 15	= .96
Season Total	= 5.28
Long Term Average	= 7.93

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Smilo Exc. Outside Sprayed 7/27/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F - E	Wgt./ Unit Basal Area F - A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
SIHY	2.5	.13	3.46		4	1.13	.28	.45	5.42
POSE	19	.95	25.33		16	6.12	.38	.32	29.37
BRTE	14	.70	18.67		20	15.47	.77	1.11	74.25
AGSM	8	.40	10.67		16	6.5	.41	.81	31.20
FEOC	5.5	.28	7.47		11	48	4.36	8.73	230.40
BOGR	15	.75	20.00		1	4.62	4.62	.31	22.18
STCO	.5	.03	.80		1	.12	.12	.24	.58
ANNUAL FORBS	10				15	7.87	.52	.79	37.78
PLPU	9	.45	12.00		15				
DEPI	.5	.03	.80		1				
LATE	.5	.03	.80		1				
TOTAL		3.75	100.00			89.83			431.18

Precipitation Data:

R. G. #36 - Smilo Exclosure	
October 15 to April 15	= 2.08
April 15 to July 1	= 1.74
July 1 to September 1	= .50
September 1 to October 15	= .96
Season Total	= 5.28
Long Term Average	= 7.93

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Sweetwater Inside Native 8/1/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F-%E	Wgt./ Unit Basal Area F-%A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
*AR SPP. POSE STCO CAFI	16.00 14.50 64.00 4.50	.80 .73 3.37 .23	16.86 77.83 5.31		5 16 19 6	6.47 34.23 2.25	.40 1.80 .38	.47 .53 .50	31.06 164.30 10.80
PERENNIAL FORBS									
*PHHO *SPCO *UNK SPP.1 *UNK SPP.2 *UNK SPP.3	15.00 .50 3.00 10.00 .50	.75 .03 .15 .50 .03			5 1 1 1 1				
TOTAL		4.33	100.00			42.95			206.16

\*Not computed in percent composition

Precipitation Data:

R. G. #11 - Sweetwater Exclosure	
October 15 to April 15	= .63
April 15 to July 1	= 2.27
July 1 to September 1	= .93
September 1 to October 15	= 1.62
Season Total	= 5.45
Long Term Average	= 6.32

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Sweetwater Outside Native 8/1/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F ÷ E	Wgt./ Unit Basal Area F ÷ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
*ARTR	148.00	7.40			7				
POSE	11.00	.55	18.03		14	7.74	.55	.70	37.15
STCO	44.00	2.20	72.13		18	25.31	1.41	.58	121.49
CAFI	6.00	.30	9.84		9	2.97	.33	.50	14.26
PERENNIAL FORBS									
*PHHO	7.00	.35			3				
*AST SPP.	.50	.03			1				
*LES SPP.	4.00	.20			2				
*UNK SPP.1	4.00	.20			1				
*UNK SPP.2	39.50	1.98			4				
*UNK SPP.3	1.00	.05			2				
UNK SPP. 4	5.50	.28			7				
TOTAL		3.05	100.00			36.02			172.90

\*Not computed in percent composition

Precipitation Data	
R. G. #11 - Sweetwater Exclosure	
October 15 to April 15	= .63
April 15 to July 1	= 2.27
July 1 to September 1	= .93
September 1 to October 15	= 1.62
Season Total	= 5.45
Long Term Average	= 6.32

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 10

No. Plots 20

Cover Determined by Area Estimate

Two Mile Hill Exc. Native Inside 7/18/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency %Base 200	Total Weight Gms/200 /sq.ft.	Average Weight Per Plot Occur- rences F ÷ E	Wgt./ Unit Basal Area F ÷ A	Pounds Per Acre F x .48
	A	B	C		E	F	G	H	I
ATNU	1561.5	7.81	75.09		124	251.25	2.03	.16	120.6
SIHY	356.5	1.78	17.12		87	340.32	3.91	.95	163.35
BRTE	21	.11	1.06		39	5.65	.14	.27	2.71
BRJA	59	.30	2.88		94	22.24	.24	.38	10.68
POSE	51.5	.26	2.50		56	8.39	.15	.16	4.03
ORHY	14.5	.07	.67		6	25.62	4.27	1.77	12.30
AGSM	8.5	.04	.38		17	1.07	.06	.13	.51
ANNUAL FORBS	1.5				3	.07	.02	.05	.03
MATA	.5	.01	.10		1				
LARE	.5	.01	.10		1				
LEDE	.5	.01	.10		1				
TOTAL		10.40	100.00			654.61			314.21

Precipitation Data:

R. G. #39 - Two Mile Hill Exclosure	
October 15 to April 15	= 2.60
April 15 to July 1	= 1.63
July 1 to September 1	= 2.30
September 1 to October 15	= 1.12
Season Total	= 7.65
Long Term Average	= 10.36

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 10

No. Plots 20

Cover Determined by Area Estimate

Two Mile Hill Exc. Native Outside 7/18/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency %Base 200	Total Weight Gms/200 /sq.ft.	Average Weight Per Plot Occur- rences F/E	Wgt./ Unit Basal Area F/A	Pounds Per Acre F x .48
	A	B	C		E	F	G	H	I
ATNU	2668.0	13.34	97.09		105	595.64	5.67	.22	285.90
POSE	32	.16	1.16		30	8.42	.28	.26	4.04
SIHY	10	.05	.36		14	5.14	.37	.51	2.47
ORHY	15	.08	.58		10	4.59	.46	.31	2.20
BRJA	3.5	.02	.15		7	.54	.08	.15	.26
BRTE	7	.04	.29		14	2.68	.19	.38	1.29
ANNUAL FORBS	3.5				7	.52	.07	.15	.25
LATE	3.5	.02	.15		7				
PERENNIAL FORBS	4.5				8	1.99	.25	.44	.96
OECA	4	.02	.15		7				
ERPU	.5	.01	.07		1				
TOTAL		13.74	100.00			619.52			297.37

Precipitation Data:

R. G. #39 - Two Mile Hill Exclosure	
October 15 to April 15	= 2.60
April 15 to July 1	= 1.63
July 1 to September 1	= 2.30
September 1 to October 15	= 1.12
Season Total	= 7.65
Long Term Average	= 10.36

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

Cover Determined by Area Estimate

No. Plots 20

Upper Gov.Draw Inside Native 8/24/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur- rences F $\frac{?}{?}$ E	Wgt./ Unit Basal Area F $\frac{?}{?}$ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
KARTR	514.00	25.70			16				
AGSM	11.50	.58	18.35		18	11.38	.63	.99	54.62
KOCR	25.50	1.28	40.51		14	12.73	.91	.50	61.10
POSE	26.00	1.30	41.14		16	9.64	.60	.37	46.28
PERENNIAL FORBS									
*PHHO	31.30	1.57			16				
*OPPO	10.00	.50			1				
*PENSTEMON SPP.	1.50	.08			3				
*ERIGERON SPP.	1.50	.08			3				
TOTAL		3.16	100.00			33.75			162.00
*Not computed in percent composition									

Precipitation Data:

R. G. #9 - Upper Gov't Draw	
October 15 to April 15	= 2.06
April 15 to July 1	= 2.66
July 1 to September 1	= .82
September 1 to October 15	= 2.74
Season Total	= 8.28
Long Term Average	= 7.79

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLUSION STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Upper Gov.Draw Outside Native 8/24/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo-sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur-rences F - E	Wgt./ Unit Basal Area F - A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
PARTR	269.00	13.45			11				
AGSM	13.00	.65	19.76		18	16.81	.93	1.29	80.69
POSE	37.00	1.85	56.23		16	15.94	.97	.43	76.51
KOCR	13.50	.68	20.67		8	8.99	1.12	.67	43.15
STCO	1.50	.08	2.43		2	.76	.38	.51	3.65
ANNUAL FORBS									
PLPA	.50	.03	.91		1	.32	.32	.64	1.54
PERENNIAL FORBS									
*ERIGERION	3.5	.18			6				
*PHHO	25.00	1.25			9				
*LEPU	.50	.03			1				
*SPCO	.50	.03			1				
*SOMATIUM SPP.	1.00	.05			2				
TOTAL		3.29	100.00			42.82			205.54
*Not computed in percent composition									

Precipitation Data:

R. G. #9 - Upper Gov't Draw	
October 15 to April 15	= 2.06
April 15 to July 1	= 2.66
July 1 to September 1	= .82
September 1 to October 15	= 2.74
Season Total	= 8.28
Long Term Average	= 7.79

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

Cover Determined by Area Estimate.

No. Plots 20

Upper Gov.Draw Inside Spray 8/24/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occurrences $F \div E$	Wgt./ Unit Basal Area $F \div A$	Pounds Per Acre $F \times 4.8$
	A	B	C		E	F	G	H	I
*ARTR	40.00	2.00			1				
STCO	2.00	.10	3.29		1	2.96	2.96	1.48	14.21
AGSM	18.40	.92	30.27		20	25.73	1.29	1.40	123.50
POSE	29.50	1.48	48.68		17	13.17	.77	.45	63.22
KOCR	7.50	.38	12.50		5	9.02	1.80	1.20	43.30
ANNUAL FORBS	3.00				5	.20	.04	.07	.97
PLPA	2.50	.13	4.28		4				
LEDE	.50	.03	.98		1				
PERENNIAL FORBS									
*PHHO	1.00	.05			1				
*CRAC	.50	.03			1				
*OPPO	.50	.03			1				
TOTAL		3.04	100.00			51.08			245.19
*Not computed in percent composition									

Precipitation Data:

R. G. #9 - Upper Gov't Draw	
October 15 to April 15	= 2.06
April 15 to July 1	= 2.66
July 1 to September 1	= .82
September 1 to October 15	= 2.74
Season Total	= 8.28
Long Term Average	= 7.79

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 1

No. Plots 20

Cover Determined by Area Estimate

Upper Gov.Draw Outside Spray 8/24/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo-sition		Absolute Plot Frequency % Base 20	Total Weight Gms/20 /sq.ft.	Average Weight Per Plot Occur-rences F ÷ E	Wgt./ Unit Basal Area F ÷ A	Pounds Per Acre F x 4.8
	A	B	C		E	F	G	H	I
PARTR	.50	.03			1				
AGSM	12.50	.63	24.14		19	10.26	.54	.82	49.25
POSE	30.00	1.50	57.47		19	8.81	.47	.29	42.29
KOCR	4.50	.23	8.81		5	2.46	.49	.55	11.81
STCO	4.00	.20	7.66		2	2.88	1.44	.72	13.82
ANNUAL FORBS	1.00								
PLPA	1.00	.05	1.92		2	.10	.05	.00	.48
PERENNIAL FORBS									
*PHHO	1.50	.08			2				
*OPPO	2.00	.10			1				
<b>TOTAL</b>		2.61	100.00			24.51			117.65
*Not computed in percent composition									

Precipitation Data:

R. G. #9 - Upper Gov't Draw	
October 15 to April 15	= 2.06
April 15 to July 1	= 2.66
July 1 to September 1	= .82
September 1 to October 15	= 2.74
Season Total	= 8.28
Long Term Average	= 7.79

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 10

No. Plots 20

Cover Determined by Area Estimate

West Pasture Inside Native 7/7/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency %Base 200	Total Weight Gms/200 /sq.ft.	Average Weight Per Plot Occur- rences F → E	Wgt./ Unit Basal Area F → A	Pounds Per Acre F x .48
	A	B	C		E	F	G	H	I
ATNU	1072.5	5.36	74.03		139	269.80	1.94	.25	129.50
ARSP	11	.06	.83		5	1.03	.21	.09	.49
ARPE	37	.19	2.62		11	14.31	1.30	.39	6.87
ORHY	66	.33	4.56		50	40.20	.80	.61	19.30
POSE	179.5	.90	12.43		72	49.84	.69	.28	23.92
SIHY	13	.07	.97		15	7.87	.52	.61	3.78
BOGR	28	.14	1.93		9	4.41	.49	.16	2.12
ANNUAL FORBS	33.5				36	11.81	.33	.35	5.67
MATA	33		.17	2.35	36				
PLPU	.5		.01	.14	1				
PERENNIAL FORBS	2				4				
*OPPO	215.5				32				
MUDI	2		.01	.14	4				
TOTAL		7.24	100.00			399.79			191.90
*Not computed in percent composition									

Precipitation Data

R. G. #13 - West Pasture Exclosure	
October 15 to April 15	= .88
April 15 to July 1	=
July 1 to September 1	= .36
September 1 to October 15	= .31
Season Total	= 1.55
Long Term Average	= 5.71

HERBAGE AND PRECIPITATION DATA FROM WYOMING HALOGETON EXCLOSURE STUDIES.  
(PLOTS LOCATED SYSTEMATICALLY AND WEIGHTS ON OVEN DRY BASIS)

Plot Size 1 x 10

No. Plots 20

Cover Determined by Area Estimate

West Pasture Outside Native 7/8/66	Total Trans. Basal Area Percent	Average Percent Basal Area	Percent Compo- sition		Absolute Plot Frequency %Base 200	Total Weight Gms/200 /sq.ft.	Average Weight Per Plot Occurrences F $\frac{1}{2}$ E	Wgt./ Unit Basal Area F $\frac{1}{2}$ A	Pounds Per Acre F x .48
	A	B	C		E	F	G	H	I
ATNU	270	1.35	8.64		43	109.62	2.55	.41	52.61
ARPE	2791	13.96	89.32		175	456.48	2.61	.16	219.11
ARSP	5	.03	.19		1	.17	.17	.03	.08
ORHY	19.5	.10	.64		15	9.55	.64	.49	4.58
SIHY	13	.07	.45		12	6.41	.53	.49	3.08
BOGR	2	.01	.06		1	.20	.20	.10	.10
POSE	22.5	.11	.70		9	2.12	.24	.09	1.02
PERENNIAL FORBS									
*OPPO	239.5				24				
TOTAL		15.63	100.00			584.55			280.58

\*Not computed in percent composition

Precipitation Data:

R. G. #13 - West Pasture Exclosure	
October 15 to April 15	= .88
April 15 to July 1	=
July 1 to September 1	= .36
September 1 to October 15	= .31
Season Total	= 1.55
Long Term Average	= 5.71

